

postulates and barriers with which we are becoming so familiar in our work of auditing.

Bearing this in mind, we rather tentatively offer the conclusion that, though a man may be brilliant in one field - even to the extent of being a genius - it does not necessarily follow that his brilliance may extend to other fields or to his interpersonal relationships.

Indeed, knowledge of the way in which geniuses of the past have behaved will aid us to make this distinction more clearly should we ever come into contact with a man of genius at the present time.

Acknowledgment. We should like to acknowledge our indebtedness to "Mental Prodigies" by Fred Barlow (Hutchinson 1951) from which we have abstracted nearly all the data quoted. To anyone who would like to know more about this subject we would recommend this excellent book most strongly. In addition to a wealth of data, this book has an excellent bibliography.

Continued from p.180.

tified in auditing professionally who has not at least attended the H.P.A. course and satisfied an examining board of his competence. Quite apart from data, there is the vital necessity of the professional auditor having sufficient really good practice to get himself into good shape, and having at least some practice in using up-to-date processes under supervision. Even if the occasional 'book auditor' might succeed in attaining these minimum requirements the majority certainly do not and I think that the risk to the field is unjustified.

I appreciate that the measures H.A.S.I. are taking to raise the standards required to obtain an H.P.A. certificate and to recall previous holders of certificates for re-training and re-examination may cause some individual hardship but, considered on all the dynamics, I think they are justified and I applaud them.

Yours sincerely
T.W.Beak."

BDR

AN INTERNATIONAL
REVIEW OF DIANETICS
AND SCIENTOLOGY

Editor

A. J. S. McMILLAN

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which didn't quite pan out. However, Mr Hubbard has seen fit in a recent bulletin (PAB.No.35) to refer to the topic again in the following terms: "...for a while in Great Britain all of the thoroughly 'stuck in' cases had a general agreement amongst them that there was such a thing as a 'white five'. This strange beast was a psychotic who merely had the idea that he could exteriorize, but actually wasn't exteriorized, but anybody who did exteriorize was crazy. This stemmed immediately from the discomfort entailed for a No-havingness case in viewing Nothing. Any time they were asked to view Nothing, they became sick and so invented an explanation to keep them from looking at Nothing, which is to say, to keep them from exteriorizing people."

As anyone who read the original article can see, in it's transmission through Mr Hubbard's hands it has acquired quite a bit of gloss, to say nothing of interpellations such as the one which may be discerned among the 'buts' - "but anybody who did exteriorize was crazy." We know full well, as Mr Hubbard knows, that genuine exteriorisation (as opposed to circuitry) is the high road to sanity.

In the article referred to we were concerned to describe a condition or type of circuit with which many auditors were familiar and about which some were puzzled. One that was difficult to recognise without the criteria mentioned in the article and which was liable to lead to enturbulation about the state of theta clear unless it was recognised that it was, in fact, a circuit or manic 'theta clear'. At no stage in the article is there the slightest hint or suggestion that anybody who exteriorises is crazy for the obvious reason that we believe, as Mr Hubbard believes, that exteriorisation is the first and most potent step towards the recovery of the abilities which the thetan denied himself when he fixed his attention on bodies.

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Penny Plain, Twopence Coloured

Eight months ago, in an editorial article entitled "Apologia" (BDR II, No.23, Feb.1954), we re-affirmed our belief in the basic ideas of scientology. In this article we indicated that the basis of our disagreement with the proponents of scientology was concerned with practical aspects of processing, in that we thought it unwise to make what turned out to be wild and unjustified claims of clearing in a few hours of processing. Our attitude then was 'to exercise a considerable degree of caution in ascribing results to techniques then available simply because we considered them inadequate for the task of releasing a 'theta clear' or an 'operating thetan' except, possibly, in a few atypical cases, and that they were more likely to result in the production of a manic or further invalidation."

We further stated that, in our opinion after hearing the January Phoenix Congress tapes, the tools necessary for theta clearance were available in SOP.8C (and subsequent material). The results obtained on recent clinical courses, particularly the one recently concluded in London, seem to indicate that this is or will be borne out in practice in some cases. We shall have more to say about this at a later date, preferring to observe before doing so and to report rather than to extrapolate from what may be inadequate data.

In the eight months since we wrote the first part of the above mentioned article we have seen no reason to change these opinions and we consider them to be borne out in practice though perhaps more slowly, so far as results are concerned, than we expected. In the second part of the article we described a condition met in processing and rather rashly proposed, as a new category of classification, the term 'white five'.

In the discussion and correspondence which ensued this idea was taken apart and clarified fairly thoroughly, and some interesting points came up. We should have preferred to let the white five lapse into the decent obscurity veiling so many of the concepts and ideas put forward in dianetics and scientology

D i a n e t i c s & S c i e n t o l o g y

In issue 36-G of Scientology and in an airletter from the Hubbard Dianetic Research Foundation at their new address 806 North Third Street, Phoenix we learn that Dianetics and Scientology are again united in Phoenix. Don Purcell has handed to Mr Hubbard all the properties and copyrights of the Corporation and has joined Dr Coulter in the development of Synergetics.

Courses are now offered in Phoenix for training to the qualification of Bachelor of Dianetics for \$250, and various other training plans are envisaged.

Mr Hubbard said: "...I appreciate it (Purcell's action) a good deal because it clears the communication lines and makes it possible for us to utilize, to the fullest, the considerable public which was generated by my first book and because it permits us to operate on two levels - one of them a mental therapy level and the other on an entirely religious level. Dianetics is very far from dead. The first book published in 1950 still sells as well as most current 'best sellers'. Even the con-tract and plates for that book are being held for me now by Hermitage House and it will shortly be republished and issued on an even wider front. I admire Don very much for this gift. I think he has done the right thing, and I think it took a real man to do such a thing. There has been no animosity of any kind on my part since Don and I went into communication again while I was in Spain last year."

Concerning the future of Dianetics, Mr Hubbard said: "All the time I have been working on Scientology I have also been working on Dianetics and laying it back on the shelf. Actually the subject has advanced enormously since 1951 when the last publications on it were released by me. The various difficulties encountered in the early days when we were trying to erase engrams have been examined by me and various modifications made in theory and practice. There is a practice now called 'perfect duplication' which erases engrams in a few seconds when you have educated the preclear to do it....Those preclears in the past suffered from Dianetic processing were only those who

could not handle heavy material and who considered force too great for them to touch. There exists now means by which this factor can be eliminated. Although some of this material has been released to Scientologists, there was no communication line extant for its general publication to the public. Thus, the removal of this communications diversion will mean a considerable amount of new material will be released in the very near future."

We welcome this rejoining of Dianetics and Scientology in Phoenix under the aegis of Mr Hubbard. We hope that the faint effluvia associated with the word 'dianetics' will soon disperse and look forward to the day when it may again be mentioned without bringing a blush to the most delicate cheek.

C a t e g o r i e s

Last month we published a letter from Mr Richard F. Steves, President of the Committee of Examination, Certification and Services of the Hubbard Association of Scientologists, International referring to categories. We wrote to Mr Steves asking him what the purpose and significance of all this was. We have received the following reply from which we deduce that the whole matter has been consigned to limbo:

Address as previously
September 17, 1954

"Dear Sir,

The Board of the C.E.C.S., at its September 15, 1954 Board meeting decided to re-instate all certificates cancelled by earlier action and that this go into full effect as from October 1, 1954.

Sincerely yours,

(signed)

Richard F. Steves
C.E.C.S. PRESIDENT"

October 1954

G r o u p N e w s

We understand that the following letter has been sent to groups from the HASI Headquarters in Phoenix:

October 9, 1954.

"Dear Group Members,

This letter is to advise you of a board resolution and a new group policy. The board resolution dated September 7, 1954 is as follows:

RESOLVED: That only a member, of whatever kind, of the HASI or its affiliated organisations shall have the right to possess and use the information of Scientology. It was moved, seconded and carried that this resolution be adopted.

This has brought about a new group policy.

GROUP POLICY:

A group must meet with the following points in order to be certified as an active HASI group, and thereby be entitled to a 30% discount on purchases of materials.

1. To be classified as a group you must have a minimum of three members. All of which must have HASI memberships. This
2. All group members must hold HASI memberships. This comes as a result of the board resolution.
3. Have a minimum of two officers to perform the functions of: Leader, Communicator, Secretary and Treasurer. You may have as many officers as you like.
4. Submit monthly reports of past month's activities and scheduled activities for coming month.
5. Invite outsiders to attend your meetings. These persons will be termed guests, until they take out an HASI membership, after which they would be group members.

The HASI will aid groups with programs, choice of materials, how to get new members and other aids to keep groups active.

The above policy goes into effect immediately. However, the group certificate which you now hold will be valid until: November 1, 1954 for groups located in the United States and

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November 15, 1954 for groups located outside the United States. If at the above designated date we have not received the attached form, your group will then be placed on the inactive list and your certificate revoked until such time as you meet these requirements.

To re-register your group fill in the attached application form and return it along with the correct amounts for the new memberships to the HASI Group Secretary, 616 North Third Street, Phoenix, Arizona. Upon receipt of your application you will be sent a new certificate, except in the case where your present certificate does not expire until December 31, 1955.

For further information, please write to me.

Best regards,
(signed)

Henrietta Hubbard

HASI Group Secretary.
Enclosure: Scientology Group Application Form."

Whether this display of the big stick will have the effect desired, we do not know. Purely as an expression of our own opinion, we should have thought it more tactful to give the groups some service first and then invite them to become members of the HASI, for we know that many groups, especially in this country, have felt neglected by, and out of communication with the official organisations.

With regard to the group reports we have given in previous months, we are glad to publish this month an article by Raymond Kemp, HPA entitled "The New Look" in which he gives details of plans to be put into effect for the benefit of the groups. We have seen how important it is to do Opening Procedure of SOP.SC thoroughly and endorse his suggestion that everyone should do this step thoroughly before undertaking any other sort of processing. Also, that this step should be used exactly as stated and without the admixture of any other sort of processing until the pre-clear can carry out all instructions serenely and precisely as given.

The CADA Bulletin

When BDR started publication in April 1952 (with the title of Bristol Dianetic Group Newsletter), by far and away the best of our contemporaries was the CADA Journal published by the California Association of Dianetic Auditors.

Unfortunately, like so many of the magazines which have been published in the field, the CADA Journal did not last and ceased publication after the fifth or sixth issue.

Recently, a small duplicated bulletin has been issued by the same organisation under the title of "C.A.D.A. Bulletin", and it has already passed from the dissemination of purely local organisational details to interesting and informative articles. Despite the disclaimer in issue No.3, we hope that the mantle of its distinguished predecessor will fall upon the CADA Bulletin and that it will become the CADA Journal in time.

You may obtain a copy of the CADA Bulletin by adopting the Anderson Communication Plan....."If you aren't a member of the C.A.D.A. and you still want to receive these monthly bulletins, do this: Write a letter or postcard telling us something of your activities in Scientology or Dianetics at least once every three months. If you haven't been active, write in and say so. Otherwise we'll have to drop you from the mailing list until you write us. Address The Editor, C.A.D.A. Bulletin, 621 So. Oxford Avenue, Los Angeles 5, California, U.S.A.

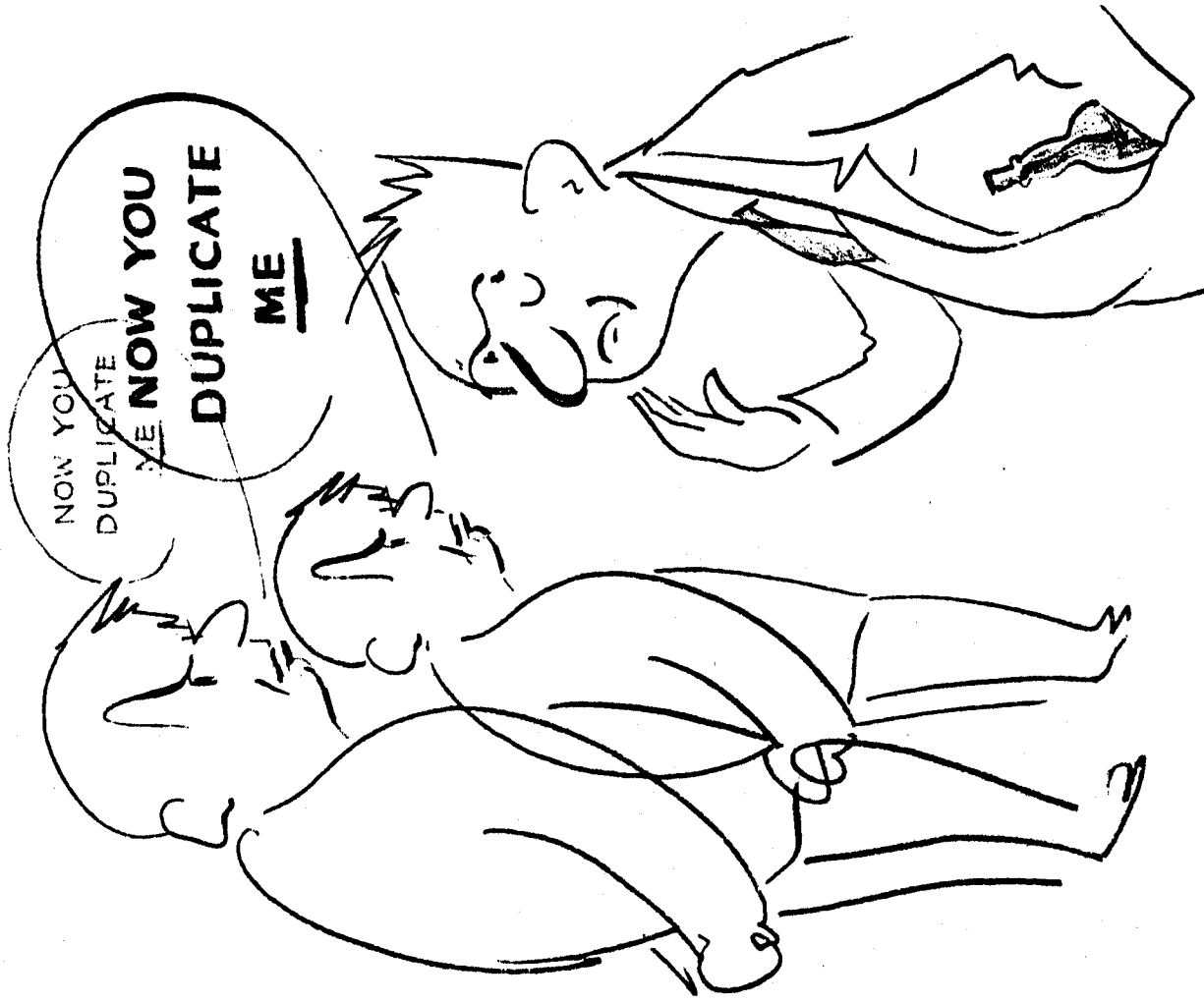
BOOK THESE DATES!

Following the extremely successful conference entitled "Introducing Dianetics and Scientology" held at Towerlease at the beginning of this year, plans are now being made for another to be held at Towerlease from 1st - 4th January, 1955.

Put these dates in your diary. Details will be published later.

.....

Confusion he say: "If Hoo sues Woo, who is the effect of who?"



The New Look

by Raymond Kemp, HPA.

London.

There has been a certain amount of enturbulation in the field of Scientology in Great Britain.

People have come and gone, interest has vacillated from apathy to enthusiasm and, at times, accusations, labels, tags - SYMBOLS have been attached to all and sundry.

Let's take a look.

The recent Journal served to place Scientology on the time track and one great MYSTERY was cleared up, i.e. the difference between 'Scientology' and 'Dianetics' - wasn't it a simple explanation? The name Dianetics was used simply for the acceptance level of the general public.

Then of course, we had S.O.P. ad infinitum, changing, modifying, simplifying - yet what a lot of us got snarled up with them.

Theta clear - MEST clear - clear - operating thetan, claims, claims, claims one after the other - "could we believe them?" - "where are these types?"

In retrospect, the solution is so easy.

What was being claimed was true, provided all was fulfilled. I have no doubt whatsoever that Ron could do all that he said, when he said it.

But why couldn't I?

Let us move on a little - clinical units appeared, more training required, more claims, more speculation.

Here, possibly, I was lucky to see the results of one of those early clinical units first hand and, was I surprised!

"This Scientology is not what I know as Scientology". Oh no! - not MORE change?

To go off on another tack for a moment, what is happening at the H.A.S.? P.A.B.s became longer and more full of data which, no sooner than it had been assimilated, was pushed into the background by the next P.A.B.

Then, suddenly - little or no data!

Then, again, complaints were rumoured around. People came and went at the H.A.S., once or twice letters went astray or were not answered.

Finally, the H.A.S. became H.A.S.I.

Well, what was going on?

I learnt the answer finally at the summer Congress.

What do you know? One answer to all these queries, one answer to all things.

Auditors could not duplicate.

People could not duplicate.

Me - you - him - hadn't been duplicating, to a lesser or greater degree, for years.

And what do I mean by this? Exactly what I have said (which is exactly what Ron had said) - people can't duplicate.

If we cannot duplicate, i.e. "make one the same as", how in MEST can we communicate? If we can't communicate, how can we get anywhere with Scientology?

Communication is the consideration and the action of impelling an impulse of particle from a source point with the intention of bringing about at the receipt point a DUPLICATION of that which emanated from the source point.

Look back at any and all of the enturbulation over the last two years, and somewhere along the line you will find a twist - a snarled up communication line.

This Ron discovered when taking top ranking auditors, with hundreds of hours of professional experience behind them and a

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record of success that, in any other profession than ours, would have been food for complacency. So what of us with little or no experience behind us, slogging along ALTERING - ADAPTING - INVENTING (?) - IMPROVING (!!!?) techniques put out by Ron.

Do not assume that I am advocating blind following of "His Master's Voice". No! what I am saying is, that if we get down to practising Scientology AS IS, instead of ALTER ISness, then we shall get an understanding of Scientology.

You see, until we have practised this AS it IS, we cannot really make any sound evaluation.

And I do not mean practise YOUR REALITY of Scientology, but Scientology AS it IS.

For a reality is the agreed upon 'apparency' of existence, and if one practises a state of ALTER ISNESS, one will achieve this 'apparency' of the ISNESS we call 'our reality'.

By now, you may be wondering what I am talking about. I am giving a simple axiom from Ron's latest work in, I hope, such a way that you will LOOK at your own case, your ideas, your environment and apply this axiom.

"Any state of existence contains a fourfold consideration: AS IS: ALTER ISNESS: ISNESS and NOT ISNESS".

What are you doing with that state of existence we call Scientology, are you considering it AS IS? or are you using an ALTER ISNESS or NOT ISNESS consideration?

If you consider that you are using it AS IS - check again, do you duplicate the data given or do you "use your judgment" which, only too often, is a rationalization of a desire to:

- (a) Be cause.
- (b) Not to be Ron's effect.
- (c) Not touch that - "It might affect me".

Now, I hope this has been food for thought, and I should like your comments.

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I know that in the H.A.S.I. this has been well and truly considered, and especially from the angle of groups and book auditors.

To this end, the London H.A.S.I. is designing a programme on a scale never before attempted.

As you know, here in London, the first clinical unit has been running and a second is planned.

The results of the first unit are staggering, almost beyond belief - for example, old friends have not recognised some of the members when they met them on the street.

Thus we are going to have auditors in England who are really good, who can really make Scientology work as it is intended.

Recently a questionnaire went out to as many of the field who could be reached, in order to gather up old communication lines and to get an up-to-date idea of the field AS IS.

Plans are being drawn up for better processing facilities for the groups and book auditors, including such things as a correspondence auditing course - new, workable techniques - monitored by the H.A.S.I. which will bring about swift results, provided they are done AS IS - provided the people DUPLICATE instructions which are being streamlined to eliminate any doubts.

Ron has started a new series of PABs giving an up-to-date BASIC course - I would advise everyone to subscribe to these.

Groups who are prepared to work hard on their state of beingness have chances of improvement that they never had before.

I know that plans are under way for out of Town Congresses, lectures and demonstrations by really good auditors.

HPAs are getting facilities for processing and post graduate training in the near future and, as those who went to the Congress will know, there are plans to which any Scientologist in the country may subscribe.

"1956 Congress in the Festival Hall" is well within the

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realms of probability.

So, no matter what has gone before, no matter what you have 'suffered' from the rapid changes of the past two years, let's get down to studying and practising Scientology - not AS WE THINK IT IS or AS WE HOPE IT IS or even AS WE THINK IT OUGHT TO BE, but AS IS.

I usually end my articles with a processing word so here it is:-

Do, for not less than fifteen hours, Opening Procedure of SOP.8C, steps (a), (b) and (c). By then, you will begin to realize what is meant by carrying out commands, i.e. duplication.

The best of luck to all of us -
May we never be the same again.

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C o r r e s p o n d e n c e

27 Highfield Road,
Bickley, Bromley,
Kent.

28.9.54.

Dear Mr McMillan,

I welcome your group report and I fully agree with the 7 points you raise. Group-auditing seems well established in our group. A few months ago I did urge members to get together for individual auditing. My co-auditor and I have had a two hour session every week since May and we both feel fine. I do not think many other members have kept up their individual sessions; however, this week with your group report in hand I will again get them going. I will suggest that some of them, who find it difficult to meet between sessions, come earlier to our weekly meetings and co-audit before the group meets.

I cannot agree with the writer of "To Set You Thinking" (BDR September). Would not any person of understanding and tact,

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whether he is an auditor of Scientology or not, try to understand the 'other fellow' and therefore share his grief, anger or whatever the mood may be? We certainly want to see the world first from our preclear's fixed viewpoint before we help him to become aware that he can look at his problems from many viewpoints. And why this barrier against the word 'Scientology'? Did we not all, ever since we read the first book on Dianetics, pull down our barriers against the style and jargon of Ron Hubbard's publications and so curtail the benefit from his wonderful observations?

We shall always be glad to see any visitors to our group meetings which are held every Thursday at the above address.

Sincerely Yours,
Elsi Lefort.

31 Thirlmere Road,
Wistaston, Crewe,
Cheshire.

28.9.54.

Dear Sir,

Herewith our group report as requested in the last two BDRs.

After co-auditing with my wife for six months, attending Newcastle-under-Lyme Dianetic Group and having a small amount of processing from Walter Brenman, HPA, HGA, I formed a group of four other people whom I had already processed successfully as private preclears. I thought that the results they were showing would automatically 'sell' Scientology to people. I consider this to be a far better method than trying to persuade folks to come along. It has not worked. There have been a few tentative, very tentative, enquiries, but that is all.

My wife no longer wears spectacles as a result of processing. This fact was not commented upon by her colleagues at work. The other day she was scratching her neck and was told by many of these same colleagues that she had a rash, must see the doctor, try this cream and the other, etc. etc. I deduce

from this that people don't want to believe in Scientology. Put the facts before them and they are still apathetic.

Thus I cannot agree from my own experience with para.5 of the group report in September BDR. I have advertised modestly in the local papers, have tried communicating about Scientology on all levels of the Tone Scale and still we have no new members.

If you can offer any suggestions or pass on successful experiences of others in this respect, I shall be most grateful. To classify us briefly, I would say that we were functioning satisfactorily, but are too small to hit any headlines.

I like BDR very much - more power to you.....

Yours faithfully

C.H.Riley, Group Auditor
Crewe Scientology Group.

(Editor's Note. We publish this letter from Mr Riley in the hope that other groups, who may have had similar experiences, will write in and say how they overcame this problem. We have made certain suggestions to Mr Riley, but they were not based on actual experience of a similar situation and we should like to hear from others who have dealt with a similar problem.)

8 Gloucester Place,
Edinburgh 3.

27.9.54.

Dear Mr McMillan,

Scientology has reached the stage where it has proved its value if properly applied. The most important task now seems to be to ensure its proper application and to protect both the field and preclears from auditors who are not fully competent, including being in first class shape themselves. From my observation there are far too many auditors using Scientology and charging fees who have not reached these minimum requirements.

Although some 'book auditors' may have done some good work in the past I seriously doubt whether at present anyone is just
(Continued at p.192.)

C a l c u l a t i n g B o y s
Notes On An Aspect Of Genius

by A.J.S.McMillan

Bristol.

From time to time our interest is caught by newspaper reports of the arithmetical feats performed by a calculating boy. They are usually reported in a rather openmouthed and uncritical fashion - the reporter being amazed, for example, by the prodigy's ability to tell him what day of the week any date was or will be, something which can be done by anyone who can memorise a code number for each month and do simple addition and subtraction of two figures, and divide the result by seven.

Nevertheless, a more critical examination shows that there is a great deal of extreme interest in the abilities of these individuals, and which will give us some insight into the broader topic of the various ways in which genius manifests itself.

Some Data

First of all, some data showing the various types of ability that these people display. Brief details only can be given owing to limitations of space. In all cases, the calculations referred to are performed mentally.

Zerah Colburn. (1804 - 1840). He first showed his powers at the age of six. At seven years, he answered questions of the following type. "Admitting the distance between Concord and Boston to be 65 miles, how many steps must I take in going this distance, allowing that I go three feet at a step?" The answer of 114,400 was given in ten seconds. "How many seconds in eleven years?" Answer 346,896,000 was given in four seconds. (Note, this takes no account of leap years). "What is the square root of 998,001?" Answered in less than four seconds as 999. By the time he was eight, he could handle 12 to 15 figure numbers with considerable facility and could extract the square and cube roots of large numbers almost immediately. For example, he named the cube root of 268,336,125 as 645 before the

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before the questioner could write the question down!

Colburn could extract the factors of even six or seven figure numbers almost immediately. When he was asked how he performed his calculations, he could only say that the answers came into his mind. When he started doing calculations he did not know the ordinary rules of arithmetic and could not, it is said, do a simple multiplication or division sum on paper.

Shortly after he was ten, his calculating power left him entirely and he died at the age of 32.

George Parker Bidder. (1805 - 1878). At the age of four he showed a striking ability to calculate and was exhibited as a prodigy. Nevertheless, it was not till the age of six that he learnt from an elder brother how to count, first to 10, then to 100! (It is not stated what form his calculating ability took before this).

His father took him about the country on exhibition and his education was neglected. At ten he was only learning to write and he could not make figures. Examples of calculations performed mentally by him are:

1816 (10 years old): "What is the compound interest on £4444 for 4444 days at $4\frac{1}{2}\%$ per annum?" Answer, in two minutes, £2434 16s. $5\frac{1}{4}$ d.

1817 (still 10): "How long would a cistern one mile cube be in filling if it receives from a river 120 gallons per minute without intermission?" Answer, in two minutes, 14,300 years, 285 days, 12 hours, 46 minutes.

1818 (11 years old): "Divide 468,592,413,563 by 9076" Answer, within one minute, 51,629,838.

1818 (12 years old): "If the pendulum of a clock vibrates the distance of $9\frac{1}{4}$ inches per second, how many inches will it vibrate in 7 years, 14 days, 2 hours, 1 minute, 56 seconds, each year being 365 days, 5 hours, 48 minutes, 55 seconds?" Answer in less than one minute, 2,165,625,744 $\frac{1}{4}$ inches.

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1819 (13 years old): "Find the number whose cube less 19 multiplied by its cube shall be equal to the cube of 6" Answer, instantly, 3.

Sir William Herschel put the following question: "Light travels from the sun to the earth in 8 minutes and the sun is 98,000,000 miles off, if light would take 6 years and 4 months travelling at the same rate from the nearest fixed star, how far is that star from the earth, reckoning 365 days and 6 hours to each year and 28 days to each month?" Answer, 40,633,740,000,000 miles (time not stated).

Bidder was unusual in that he studied hard at school and was successful in life as an engineer, eventually becoming president of the Institute of Civil Engineers. He retained his powers to the end of his life and was one of the few who was able to give a coherent account of how he did his calculations. These will be discussed later. His phenomenal memory enabled him to handle enormous figures.

Johann Martin Zacharias Dase. (1824 - 1861). He had little education and, although able to do enormous calculations in his head, was nearly incapable of understanding the principles of mathematics and of little ability outside his field. He exhibited widely and met many of the distinguished men of his time. Petersen tried in vain to get into his head the first elements of mathematics, Schumacher referred to his extreme stupidity. Professor Straszniaky educated him to the point where he could do scientific work under the direction of a mathematician.

He seemed anxious to use his powers to do useful scientific work and in 1847 reckoned the natural logarithms of numbers to seven places of the numbers from 1 to 1,005,000. He was unusual in that he could work as fast on paper as he could in his head and he could also do long problems with incredible speed. He published several other valuable mathematical tables.

He came to London in 1850 for exhibitions and his general obtuseness caused comment, he could not even be trained to follow a proposition in Euclid.

Examples of the type of calculations which he did mentally are: Multiply 79,532,853 by 93,758,479 and he had completed writing down the answer in 54 seconds. He multiplied mentally two numbers each of twenty figures in six minutes; of forty figures in forty minutes and of one hundred figures in $8\frac{1}{4}$ hours. He extracted mentally the square root of a number of one hundred figures in 52 minutes.

Another gift which Dase had was the ability to count objects with the greatest speed. He could state the number of peas in a handful scattered on the table at a single glance, and the ease and rapidity with which he could count sheep in a flock, or books in a bookcase amazed everyone who saw it. He was probably one of the greatest of the calculators.

George Parker Bidder Jnr. Q.C. (b.1837). The son of G.P. Bidder mentioned above. He distinguished himself at mathematics at Cambridge and then became a barrister. His ability was not so marked as his father, but he could do extensive calculations in his head to the extent of multiplying two fifteen figure numbers mentally. He said his calculations took place in a visible form in his mind. His daughters showed calculating ability above the average and a grand-daughter, who showed great visual memory, said: "When I hear anything remarkable read or said to me, I think I see it in print."

Jacques Inaudi. (1867 - 1950). He was a shepherd (as several others not mentioned were) and first showed his ability at six years old. When he was seven, he could multiply two five figure numbers together. He had little education and did not learn to read and write until he was 20 years old. Apart from his mental calculations he had no special ability, his memory for most things, apart from figures was not good and he was often absent minded. He exhibited widely and one of his most sensational performances was a match with three calculating machines set to work out three different arithmetical problems simultaneously. M. Inaudi always gave the answers before any of the machines had stopped ticking.

At his regular performances the programme included the sub-

traction of one 21 figure number from another, the addition of 5 six figure numbers, the squaring of 4 four figure numbers, the division of one 4 figure number by another, the extraction of the cube root of a nine figure number and the fifth root of a 12 figure number, or such similar problems as were submitted by members of the audience.

Inaudi was unusual in that his memory was of the auditory type. When he thought of numbers, it was as though they were spoken in his own voice and during his calculations he always pronounced at least some of these words. When asked if he could give any indication of his methods all that he could say was that he 'heard the answers'.

He had the most phenomenal memory for figures. In one experiment he was able to repeat, after a single hearing, though with an effort, 36 figures read off to him slowly in groups of three, and in the attempt to repeat 50 figures in the same conditions, he became confused and only got 42 of them right.

In an experiment to see how long he would take to learn 100 figures read off to him in groups as often as requested, he learnt the first 36 in $1\frac{1}{2}$ minutes, the first 57 in four minutes and the whole 100 (actually 105) in twelve minutes. He could repeat in order at any time within a day or two, all the figures used in his last performance, whether in the statement of the problems, the answers or in the intermediate calculations.

Arumogam. (b.1896). A native of Ceylon, he first displayed his gift at the age of 12. He was not intelligent and could not take care of the money he earned. Examples of some calculations set him by the Education Department of Ceylon when he was 16: Multiply 45,989 by 864,726; find the factors of (a) 28,413 (b) 89,712; The diameter of a sovereign is $\frac{7}{8}$ ", how many placed in contact would it require to stretch from London to Liverpool (196 miles)?; Find the square root of 63,409,369; Find the cube root of 20,570,824; Find the fifth root of 69,343,957; At what rate per cent simple interest will a sum of money double itself in thirty years?; A square field has a plantation eleven yards wide running along all four sides within the boun-

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dary of the field. This plantation contains one acre, find the area of the field.

It is stated that he answered all the problems 'in a few seconds' and that any delay occurring was due to the necessity of interpretation (he spoke only his native Tamil).

A member of the audience proposed the following problem and the answer was given in less than three seconds: A Chetty gave as a treat to 173 persons, a bushel of rice each. Each bushel contained 3,431,272 grains and the Chetty stipulated that 17% should be given to the temple. How many grains did the temple get?

A Mr Arunachalam gave the following description of the methods used by Arumogam: "Thus to take a simple sum of multiplication, say of 2555 by 3437. Of course, he deals in figures with millions and billions, but I take this for simplicity of illustration. He would take the first number as 2500 (2½ thousand), the remainder being 55. The other number he would take as 3500 (3½ thousand), the difference being 63. He would multiply 2½ thousand by 3½ thousand and then make the necessary addition for the remainder 55 and the difference 63 and declare the result in a twinkling of an eye."

Maurice Dagbert. (b.1913). Dagbert was unusual in several respects. The development of his gift did not start until, at the age of 17, he met Inaudi. He made the latter his model and trained intensively for a number of years, this was interrupted by the second world war during which he spent three years as a prisoner.

He appeared, at the age of 32, before a commission of the French Academy of Sciences which reported favourably on him. Some examples of his calculations appear later. His memory was prodigious, he had by heart the value of pi to 707 places of decimals! and if he was asked to name the figure for, say, the 320th decimal place (or any other), it is claimed that he could do this accurately.

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Examples of mental calculations by Dagbert:

He gave the cube root of 260,917,119 (= 639) in 4 seconds. Raised 89 to the sixth power (= 496,981,290,961) in 10 seconds. Gave the number of seconds in 58 years (= 1,830,297,600) in 23 seconds.

An unusual example of doing more than one thing at the same time is shown by a performance he gave. He asked for a violin and asked his audience to set him four cube roots to extract of three figures to the root, whilst he read, for the first time, a simple piece of music. He undertook to give the result of his figuring at the end of 32 bars. The piece selected was a little known portion of a concerto by Albert Bachmann. He was asked to extract the cube roots of 397,065,375: 57,960,603: 152,273,304 and 665,338,617. The four results (735: 387:534 and 873) were obtained as promised and the time taken was 85 seconds.

Shakuntala Devi (b.1920). Is of interest as being the only female calculator mentioned. Her abilities follow the familiar pattern of rapid arithmetical manipulation of large numbers.

She could only explain that the answers 'came' to her. She usually spends the twenty four hours before any demonstration 'concentrating' and it appears that this concentration consists of thinking, so far as is possible, of nothing at all (interesting?).

Some Comments

We hope that the mass of data given above has not proved too indigestible, we have only referred to a few of the cases quoted in our source, merely sufficient to bring out several points of interest.

The first point of interest is that all these calculators have had what must be virtually eidetic memory so far as figures are concerned, though often not good in other respects. Even so, they were not completely so as most of them were of the visual type, but not all (cf. Inaudi for marked auditory memory).

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Secondly, we find that some, but by no means all of the calculators have been dull, stupid or even mentally deficient (this is particularly true of several cases not quoted). This has been sufficiently marked to earn them the title of 'idiots savants' (wise idiots).

Dr Frank D. Mitchell ("Mathematical Prodigies" American Journal of Psychology, XVIII, 1907) comments: "Neither mathematical nor general education nor mental ability has any direct influence on mental calculation. Indirectly, however, education may have an important interest. We have seen that if, for any reason, the interest in calculation is lost, the calculating power will disappear. Now mental calculation is a narrow and special field, with little practical importance to most men; hence, other things being equal, as a boy's sphere of interest widens, his interest in mental calculation is likely to sink into the background. This explains why so many ignorant men have excelled as calculators; ignorance, by preventing the intrusion of other interests, leaves the calculator free to develop his one gift, and keeps him from realising how trivial it is, and how groundless is the public amazement which, perhaps, contributes to his support.

"Given a knowledge of how to count, and later, a few definitions, as in Bidder's case, and any child of average mental ability can go on, once his interest is aroused, and construct unaided practically the whole science of arithmetic; no matter how much or how little he knows of other things... Once the elementary processes are mastered, such operations as the reduction of years to seconds, compound interest and any other arithmetical problems, are simply a matter of understanding the meaning of the question and then applying known rules, plus a varying amount of ingenuity, to the solution."

This comment, while offering an explanation of why dullards are often calculators and why the gift may disappear after being exercised for a few years, takes no account of either the phenomenal memory or the amazing speed at which the calculations are performed. We agree with Dr Mitchell's picture of the in-

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dividual, once his interest has been aroused, working away for countless hours at various calculations and so increasing his ability. Perhaps it has been of value to them that they had no formal schooling with its inevitable invalidation, at all events, they seem to have no barriers or not so many barriers when doing arithmetic as we do. It is probably this factor of having no limitations on one hand which permits them to perform in the way that they do.

Few of the calculators have been able to give any coherent account of how they do it, a notable exception being the elder Bidder who described his methods. These followed fairly normal practice, but the speed at which he did the calculations deceived him and he thought that he had the multiplication table to 100 x 100 when such was not the case - "Suppose I had to multiply 89 by 73; I should say instantly 6497. If I read the figures written out before me I could not express a result more correctly or more rapidly. This facility has, however, tended to deceive me for I fancied I possessed a multiplication table up to 100 times 100 and when in full practice even beyond that, but I was in error. The fact is that I go through the entire operation of the computation in that short interval of time which it takes me to announce the result... The velocity of the mental processes cannot be adequately expressed; the utterance of words cannot equal it... Were my powers of registration at all equal to the powers of reasoning or execution, I should have no difficulty, in an inconceivably short space of time, in composing a voluminous table of logarithms."

Others could not be so explicit. Zerah Colburn was unable for three years to give any sort of explanation of his methods and then what he did disclose was not of any great value though it did show that he tended to break down large numbers into factors more easily multiplied. His rule for finding square and cube roots was so clumsy and involved that he admitted that it was 'a drag of a method'.

Dagbert was unusual in that the appearance of his gift was not spontaneous but came as the result of many years of prac-

tice. He said that he had an infinite number of shortcuts, that he taught himself the rules he used, these were purely empirical and he was unable to give any explanation for them. For example, to cube a number of two figures he made use of two key numbers which he knew by heart, but of which he could not give the origin.

An interesting fact about all the cases which we have instanced is that the calculators only solved arithmetical problems, that is, problems involving ordinary arithmetical manipulation of numbers such as addition, subtraction, multiplication, division, extracting roots and factors. They did not do problems which involved any mathematical reasoning or deduction, in fact, they behaved like calculating machines which were able to set up their own programmes. This is an important point which shows that in these displays reasoning ability is not involved, but that, in some way, the ordinary mechanical operations of arithmetic are immensely speeded up possibly, as we have suggested above, by the self-limitations and barriers to such figuring that most people set up as a result of contact with their (school) environment being absent in the case of the calculators.

However, we must admit that there have been cases where men of ability fairly described as genius have also been calculators. This calculating facility has usually been masked by their general ability. One of the great encyclopaedists of the 18th century, André Marie Ampère, was a great calculator as a child, he had an almost eidetic memory for what he read and, at an early age he learnt a twenty volume encyclopaedia by heart to the extent that, fifty years later, he could repeat long passages quite correctly. In addition to the studies on electric current with which his name is associated, he became professor of mathematics and chemistry, writer on probabilities, psychologist, metaphysician, member of the Academy of Sciences of Paris, discoverer of fundamental truths in electro-dynamics and a defender of the unity of structure in organised beings.

Carl Friedrich Gauss, the greatest mathematician of the 19th

century, was a calculating prodigy, but his ability at mathematics soon appeared. It is said that a new professor of mathematics handed back to the thirteen year old Gauss his first exercise with the remark that it was unnecessary for such a mathematician to attend his lectures in future.

Gauss was always distinguished for his ability to carry out difficult investigations and extensive numerical calculations with incredible ease, and he had an amazing memory for figures. If he did not know the answer to a problem at once, he stored it up for future solution. He would often pursue a calculation for days and even weeks and, what distinguished him from most other calculators, during such a calculation he continually invented new methods.

These two examples show that it is not possible to lay down any hard and fast rules. Our earlier examples show that the ability to calculate is not necessarily associated with other abilities or even with intelligence. At the same time, the last two show that a high degree of intelligence is not necessarily a bar to calculating ability as Dr Mitchell, quoted above, would infer.

Examination of the abilities and lives of men of genius in other fields often seems to show that, while they may be exceptional or brilliant in a particular field or associated fields of activity, in others they may be mediocre, credulous or even stupid. In this connection it is worth stressing that Emerson's definition of genius as one-third inspiration and two-thirds perspiration is just what genius is not. This may be true even of outstanding ability, but the genius appears to be 'wide-open' along one particular band, be it wide as in the case of Ampère or Gauss or narrow as in the cases of the 'idiots savants'. A point worth noting is that nearly all geniuses have been distinguished by remarkable memories, often to the extent of being eidetic for one perceptic and this is an indication that in some way a particular barrier or self-limitation is absent so that the individual may be said to be wide-open in that particular field, using his powers without limitation. However, in other fields, he is subject to the self-limiting