EDITORIAL

The AGM -- held for the third successive year at the Central YMCA - on May 28 was not specially well attended, although it was pleasing to note the presence of several new, young members, amomg them John Lusardi,Cliff Temple and Malcolm Warburton.

One of the few controversial matters discussed concerned the inclusion of estimated (intermediate) times in the 3 and 6 miles lists: Richard protested strongly - in writing -- about these fabricated marks, but Bob Sparks made a clear, rational defence of his practice. It was, however, suggested that we revert to the method-used in the first two editions-of showing the best times at 220,440 and 880 yards for those athletes whose best mark occured at the appropriate equivalent metric distance(after adding the usualconversion factor, of course).

Cliff Temple has suggested that the NUTS compile a UK Track Directory containing the following details :

Name,address and ownership of track

Size of track

Surface--Cinders,whether En-Tout-Cas Olympic,Grass, etc.

Other General details-- whether sheltered from wind,covered stands etc.

Field event facilities,details of any steeplechase jumps,cinder,grass or bitumen-composition long jump run-ups etc.

Training days

Home clubs

Brief description of local route to track

Track records

This would seem an excellent project for the NUTS to try: if members carried out the necessary research in the next six months it ought to be possible to have a publication ready in time for the 1967 outdoor season,

FROM THE SECRETARY

Andrew says the AGM was not particularly well attended, but actually 17 attended and another dozen sent apologies, which means that over 50% of the membership did,in fact,take note of the fact that the meeting was taking place and did something about it. This must be a record for any organisation, except Croxley Striders, which gets three-fifths of its mebership out every time it meets! There is a change in the composition of the General Committee. After seven year's service as ordinary committeeman and secretary Pat Brian felt that his removal to Byfleet would not give him sufficent time to devote to the committee and he did not offer himself for re-election. Brian Nott was elected in his place. We welcome Brian to the committee and thank Pat.

I reported in my annual report that we had asked Mike Hayes to become a member. I am pleased to say that Mike has accepted. We also elected Shaun Adair to membership at the last committee meeting. Shaun is one of those who answered our call for help in February, and has already proved he is worthy of full membership. Would you, therefore, please make the following additions to your directory of members:

Dr. M.B.H.Hayes,Chemistry Department,University of Birmingham,Birmingham 15.

S.Adair,35 Spital Terrace,Gainsborough,Lincs.

The following changes of address should also be noted :

Peter May,The Flat,12 Sherborne Drive,Windsor,Berks.

Adrian Metcalfe, 4 First Cross Road,Twickenham Green,Middx.

Keith Morbey is also moving shortly and members are advised to keep a look out in Athletics Weekly for his change of address.

NOTEWORTHY PERFORMANCE

220y H Chris Thorne   27.6 (1)   Cambridge   2 May 1957

INTERVIEW WITH BOB SPARKS

You have gone on record as saying that you spend so much time collecting and organising data for the annual that you have little or no time to do anything with it. As a trained Statistician what analyses would you like to carry out and what statistical methods would you employ?

I would like to analyse the development of standards at various levels for the years that we have been collecting data. However, it is not feasible to attempt to use mathematical statistical methods on athletics

statistics, because the data does not conform to the requirements for correct analysis. The sort of questions one is likely to ask may possibly be answerable with the aid of some clever maths and a few dubious assumptions, wheras a simple summary of the performances, such as the tables in the 1965/6 Annuals, could provide many of the answers with a modicum of common sense and a minimum of hard work. For example, it is not much use trying to compare Top-10 averages using statistical tests, because these invariably depend on the data being random and independent, and nothing could be less random or independent than the best 10 results.

Naturally the tables which were compiled for the 1965 and 1966 annuals were restricted to the space available. An extension to incorporate percentage changes from year to year, perhaps plotted on graphs, would make an interesting exercise. On e might also obtain some useful results by comparing averages of groups other than the top ten (e.g. 11-20,21-30 etc.), and there are several other ways one could re-vamp the basic data into easily assimilable form. Incidentally, I would like to emphasise here my objection to the sort of statistical summary which tabulates the performances achieved by certain ranked athletes (e.g. the 10th,20th,30th, etc.), as opposed to my system in which the number of athletes who have achieved a certain standard are shown. Take as an example the 100 yards in 1963,1964 and 1965 :

(A)	1963	1964	1965		(B)	1963	1964	1965
9.5 & better	3	1	1		1st	9.5	9.5	9.5
9.6 "	6		8		10th	9.8	9.7	9.7
9.7 "	9	10	12		20th	9.8	9.8	9.8
9.8 "	21	20	24		30th	9.9	9.9	9.9
9.9 "	48	55	53		40th	9.9	9.9	9.9
10.0 "	103	102	116		50th	10.0	10.0	10.0
					100th	10.0	10.0	10.0
No. of Perfs 9.7 & better	36	34	30		30th perf.	9.7	9.7	9.7

These figures surely speak for themselves as to which system gives the most meaningful comparison.

There are three projects on which I am currently working, when I can find the time. Firstly, a new system of conversion tables, which will take into account the new rules for measurements in the discus,hammer and javelin. Secondly, publication of my 'thesis' on wind-measurements for 220's on a turn (a subject with which I have long been boring the Committee). Thirdly, a detailed study of estimating intermediate times during 5000m and 10000m races, plus a sliding-scale conversion table for equating 3 miles/ 5000m and 6 miles/10000m performances.

You did, of course, expose the inadequacies of the 1952 IAAF scoring tables in AW which resulted in Melvyn's plea for the "average reader", who he claimed, found "advanced mathematics.. to be of little appeal" (Whether quadratic equations constitute advanced mathematics is, I suppose, a matter of opinion.) What do you think of the new IAAF tables, as well as the French and Portugese systems ?

I have not studied the new IAAF tables in detail so I cannot comment on much,except the price, which I thought excessive. However, they appear to be based on somewhat better mathematics than the old tables, so they should prove more satisfactory on that score. The most obvious fault, to which all decathlon tables are liable, is the poor choice of comparative standards, which means that some events seem to be relatively badly marked in comparison with the others.This, does not,however, affect their value as decathlon tables,which is,afterall, their primary function. The 1952 tables broke down because of the choice of an inverted quadratic function for the basic performance curve in the field events,which led to a maximum scorable performance. In the new tables, the quadratic has again been used; but with the axes reversed, which prevents such a ridiculous situation arising. However, the choice of the quadratic is still rather puzzling,since it is an inefficient function for estimation of something like athletics performances curves; in the track events,incidentally, the curve has been calculated on speed (metres/seconds) not time and is again a quadratic function. There is no doubt that an exponential function would

give a far better curve - but possibly the compilers chose the quadratic for ease in calcualation.

I think most Track Statisticains have accepted the Portugese tables as being the best attempt so far in this field; they always seem to be realistic, but I must admit that I find the underlying mathematics somewhat mysterious. There are pages of complicated explanatory notes and neat looking sums, but nowhere can one find a basic equation -- only what appears to be inspired guesswork,with all sorts of odd afctors being introduced ihto the arguments,without being justified,or even explained. Yet the funny thing is they seem to produce meaningful results. The French tables are interesting in that they are based on accepted mathematical principles (exponential functions are used for the basic performance curves),but they seem to be limited by an odd choice of paprameters and an unnecessary restriction in the range of points (0 - 500 as against 0 - 1200 in the IAAF tables).

Obviously, there is much scope for using ADP (eg.punch cards) in preparing our lists. Have you any detailed ideas on how ADP methods could be utilised ?

I ahve a number of embryo ideas,some of which I hope may develop in time for next year's booklet. Perhaps the most fruitful idea is to partially automate the production of the ranking lists and index lists. These could be tackled by having pre-printed forms which would be used by the compilers for their final lists; instead of being tyoed, these lists would be sent to a punch-card bureau (there are a couple in the London area for whom this job would be a mere fleabite) and converted into punch cards. The turn round time should be something in the region of one week, and the cost perhaps £30 - this is for punching and verifying, the expected volume being about 7500 cards. Non-ranked results (e.g. windies, downhills, and performances) can ve tackled on similar basis, and late additions can be easily dealt with prior to listing off the cards in the final format a la World Sports Annual. The next stage is to sort the ranked performances (i.e. after out-sorting any interpolated extra performances and windies etc.) into alphabetical order, and then relist to obtain a skeleton index. The index can then be completed by the additéon of dates of birth,clubs and previous best performances before being typed in the normal way. The major obstacle to a fuller use of punch-card systems is of course the cost,which would be prohibitive for anything but the simlest projects. The only way of getting round this would be to obtain the sponsor ship of one of the major computer firms, such as IBM or ICT, but this is just a pipe-dream!

Finally,do you think a track enthusiast's wife needs to possess any special qualities? If so, which one do you consider is most essential?

I think the partner of any person who has a really advanced enthusiasm for some exotic pastime (be it trackntics,philately, cross-channel swimming or whatever) should, ideally, be able to acquire some interest in the course of time - naturally the more the better. Particular virtues in a track nut's wife would be patience, especially between the hours of 10.30 P.M. and 12.30 A.M.; dislike of cricket and horse racing; a masochistic delight in doing all the gardening,home decorating and do-it-yourself handiwork; and a well-developed sense of humour,particularly where Len Gebbett and athletes such as Herbert Scrudd and "Unattached NW 6" are concerned. Decided drawbacks are - jealousy of Mary Rand; not wanting to listen th every regional sports report on Saturday evenings; and refusing to continue typing after 11.30 A.M.

NATIONAL ASSOCIATIONS OF ATHLETICS STATISTICIANS - No. 1 France

At a meeting held on October 2, 1965 at the offices of the FFA (Fédération Francaise d'Athlétisme), the ASFA (Association des Statisticiens Francais d'Athlétisme) was formed.

Like the NUTS, ASFA has a constitution containing 10 Rules (Statuts),though these are slightly different and considerably shorter than ours. Until the first AGM of ASFA in the autumn when the Executive Committee (Comité Directeur) is formally elected, the work of the organisation will be implemented by and ad hoc committee (Bureau Provisoire) of 5 members ; Alain Bouillé, Tony Dupont, Robert Mariente, Christian Verdez and Jean Wouters. The Secretary is Yves Pinaud, brilliant young (25.5.45) expert on African track and field. There are 44 other mebers but, like the NUTS, ASFA has only one woman member, Mlle Renée Maury. They range in age

from Roger Debaye (28.6.13) to Gerard Dupre (21.10.47) and a wide variety
of occupationsa re represented,headed by journalists (Roger Debaye of
"Parisian Libéré" and "Miroir des Sports", Tony Dupont of "La Voix du Nord"
André Halphen of "Télé-Poche",René Maupas and Robert Parienté of "L'EQuipe",
Jacques Viron of "Le Republicain Lorrain") and teachers (Roger Basset,
Roger Bontemps,Michel Guittard,Mlle Renée Maury,Alfred Richard).

At a meeting of ASFA held on February 19, the main item for dis-
cussion was the distribution ôf work on the 1966 lists. It was decided to
split the work of compilation on a regional basis (25 areas, including
North Africa were designated) and on an events basis (9 compilers, with a
national co-ordinator,Robert Parienté).

The NUTS send fraternal greetings to ASFA and wish them success
in their work. I should like to take this opportunity to thank personally
André Alberty for most of the above information   A.H.

I recently sent Yves Pinaud a copy of the 1966 book, and in
return he sent his best wishes to all of our members -- they hope to publish
some sort of book next year.   P.J.H.

ISOMARKS?by Mike Woolf

Early last year ATHLETICS WEEKLY printed two or three letters
expressing opinions on the various scoring tables and the consequent effect
of these upon the decathlon. These letters suggested to me that confusion
was widespread amongst the athletics public concerning the basis and the aim
of the tables. I'd like to deal briefly with the production of these tables,
and then at some greater length discuss the aspect of them that most interests
me:the physical basis on which a specific section of them should rest.

I think we all realise that the aim of the tables is to allow
quantitative comparison of marks made in varying events. Essentially there
are three problems to be solved in drawing up such tables:
 1) to determine equivalent performances at all the standard events.
 2) to assign points to the performances in any one event,where in both 1)
and 2) the marks are to cover the full range of observable performances.
 3) to extend the tables to as yet unobserved performances.

The burden of 1) is thrown upon the statistician, and for details
I would refer the reader to the explanations offered in the relevant tables.
I would merely comment after reading the same in detail that I believe
improvements can be made by anyone of sufficient knowledge,who has access to
a computer for lengthy periods of time. However, in principle, the general
idea behind this part of the task is more or less on solid ground.

The methods used for 2) are by no means so well founded: One
cannot refer to athletics performances for any guidance in this matter, and
all tables usedso far have solved this problem by making assumptions or
possibly laying down definitions (they do not make clear which of these
corses they are actually adopting).One is reminded of of the situation
existing in thermometry before Joule and Kelvin clarified ideas on heat and
work, and Kelvin showed that 'absolute' scales of temperature could be form-
ulated(the most accepted scale is the work scale and I believe this has
relevance as I shall later attempt to show).
The approach adopted is to advance formulae of the type

 a) $\Delta p = c \Delta x/x$
 b) $\Delta p/p = c\Delta x/x$
 c) $\Delta p/p = cdx$

where p is the points scored by a performance x (which may mean distance
in throws or jumps or mean velocity in track events), and Δp a small
increase for a small improvement of performance Δx.
These formulae lead to relationships of the form

 a) $p = c \log Ax$
 b) $p = A x^b$
 c) $p = A \exp (cx)$

and each of these by suitable choice of A and c (arbitarily assigned in
all tables so far produced), enables points to be assigned to all marks
both accomplished and yet to be realised. Thus 2) and 3) are taken care of
simultaneously.

The above procedure is not in any way correlated with any physical
reality however, and it has always seemed to me that the tables should carry
the germ of some physical truth.

I offer the following suggestion :
Let us postulate an 'ideal' athlete, and let us further state that work

is to be the criterion by which we assess performances. Suppose that our ideal athlete runs the same distance on two occasions. On the first run he records a time t1, converting glycogen to fuel at a rate G1, and on a second run he records a time t2 with a glycogen rate of G2, then I propose that the ratio of marks for the first run to the marks for the second should be G1/G2 and that the tables consequent on such a definition have some physical significance as apart from mere mathematical convenience as is the case with all the existing tables.

No relationship of the form a), b) or c) is likely to be obtained and the form

$$p = A + Bx + Cx^2 + \ldots\ldots + Nx^n + \ldots$$

is more natural, where A→N are obtained from experiment. I am aware that the experimental difficulties are immense, but they are not insurmountable.

I wish now to deal specifically with the track events. The smoothness of the curve obtained by the statistical procedure of plotting the reciprocal of the mean velocity the average of ,say, the top 100 marks (suitably adjusted) against the distance run stems from the underlying physical process occuring. Let us suppose that the condition of an athlete is specified by one parameter θ which is the oxygen debt, and we are able to advance the following differential equation

$$d\theta/dt = F1 - F2$$

where $d\theta/dt$ is the time rate of increase of oxygen debt, F1 is the rate at which the debt is being increased by the conversion of glycogen and F2 is the rate at which oxygen is being assimilated.

To a first approximation we may regard F2 as a constant in normally obtaining race conditions. F1 certainly depends upon velocity. Does it depend on the oxygen debt? That is, does our tiredness make us less efficient? The answer is probably that the highly trained specimens that we are dealing with have good tolerance to fatigue, and only when θ approaches its maximum does any appreciable lack of efficiency occur (there are theoretical reasons for supposing the validity of this based on concepts of order and disorder), so we regard F1 as independent of θ. The effects of other variables on which F1 may depend can be considered as negligible. Thus for a first approximation

$$d\theta/dt = f(v) - A$$

The form of f(v) will be intimately connected with the experiments performed on the 'ideal' athlete. This equation can be solved exactly or numerically for varying f(v) with suitable boundary conditions (one such is obviously $\theta = \theta$ maximum at full distance run) to give relationships between distance and time. Anyone interested can check such details as to whether even pace running is always better than variations in pace, and what improvements may be expected from increasing θ max or A. It appears that explicit formulae for t or reciprocal mean velocity in terms of x are not obtainable, and so it may be better to plot not 1/v against x as is usual but $1/\bar{v}$ against t.

Also this approach suggests that there exists a limit for $1/\bar{v}$ (where f(v) = A), and that all attempts to fit actual 1/v to x data by equations of the form

$$1/\bar{v} = a + b/x + cx^2 + \ldots\ldots$$

are bound to be no more sectionally true and equations of the form

$$1/v = a + b/x + c/x^2 + \ldots\ldots$$

may bear more relevance. Certainly trying to fit the form

$$1/\bar{v} = Ax^t$$

is doomed to failure or distortion (almost no physical phenomena truly obey such relationships).

I hope this may set one or two of you to ponder and if anyone has any comments I would be only too glad to hear from them.

Excerpt from the OBSERVER of July 3 1966 :-

ATHLETICS - Welwyn 15 miles road-jumping race - 1. B.Kilby etc.