University College Hospital Magazine

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At the present time there is a shortage of empty lockers in the Medical School. The Old Students whose names are given below are earnestly requested to return their locker keys, if they still have them, to the Medical School Office, and to note that unless instructions to the contrary are received within a reasonable time the contents of the lockers in question will be disposed of as salvage.

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EDITORIAL.

In future the magazine will come out quarterly. The reduction of two issues a year is an inevitable result of a further paper cut. The price will be ninepence a copy. This brings the cash price up to the average of the yearly subscription.

We very much regret this step. The only consolation we see is so much less work for the editor.

can introduce some order into the realm of unreasonableness by making an objective study of it, and on the basis of our conclusions we can provide for it. Secondly that with human individuals as with electrons, although there is no knowing how any given one will behave, it is possible to influence the behaviour of sufficiently large numbers of them to some extent.

This seems a good thing and fits in with our own everyday findings; that the individual is an unpredictable random creature with all the variation his make up can provide, while a community has its components' freakishness cancelled out internally and being thus delivered can be assisted to the path of its own reasoned salvation.

We can finish then by making a conclusion that would have seemed, to say the least, curious in 1913. To-day we must be prepared to see the future in terms of a reasoned society made up of unreasonable people.

L. A. HUMPHREY.

HE-GOATS INTO YOUNG MEN:

FIRST STEPS IN STATISTICS.

WHEN a worthwhile experiment is carried out, it is only too frequently vitiated by a lack of statistical knowledge, and its apparent failure deters others from repeating it. This lamentable fate appears to have overtaken an experiment carried out some years ago in Germany which, had it been pursued, might have enabled us to measure one of the most difficult subjects of investigation, an abstract character—in this case purity in heart. It is true that the original investigation had no such object: all that was proposed was to discover whether by exact repetition of suitable necromantic spells (under appropriate standard conditions) a virgin he-goat could be converted into a healthy virile young man. The only source now available to me (1932) states:—

"The legend of the Brocken (the famous peak in the Harz Mountains noted for its 'spectre' and as the haunt of witches on Walpurgis Night), according to which a 'virgin he-goat' can be converted into a 'youth of surpassing beauty' by spells performed in a magic circle at midnight, was tested on June 17th by British and German scientists and investigators, including Professor Joad and Mr. Harry Price, of the National Laboratory of Psychical Research. The object was to expose the fallacy of Black Magic and also to pay a tribute to Goethe, who used the legend in 'Faust.' Some wore evening dress. The goat was anointed with the prescribed compound of scrap-

ings from church bells, bat's blood, soot and honey. The necessary 'maiden pure in heart,' who removed the white sheet from the goat at the critical moment, was Fräulein Urta Bohn, daughter of one of the German professors taking part in the test. Her mother was a Scotswoman (formerly Miss Gordon). The scene was flood-lit and filmed. As our photographs show, the goat remained a goat and the legend of the Brocken was dispelled."

It will be observed that the only incompletely controllable variables in the experiment (excluding local variations in the church bells, bat's blood, soot and honey) are the virgin he-goat and the maiden (? virgin) pure in heart. Virginity may for the present be regarded as an absolute character—purity in heart no doubt varies from person to person. If, therefore, a reasonably uniform supply of virgin he-goats can be obtained, and the percentage of he-goats converted bears any relation to the purity in heart of the maiden used, we ought to be able to measure the degree of purity in heart of the virgins available. If experience with the variability of other experimental animals is any guide, he-goats will vary considerably in their convertibility into young men, and it is extremely important that only very susceptible preferably pure-bred strains should be used, with suitable precautions to ensure virginity. We should also have at our disposal a number of virgins sufficiently large for their indices of purity in heart to be distributed over a wide range. It is a reasonable assumption that the conversion of he-goats into young men is an all-or-nothing process—either complete conversion or nothing occurs. A fair comparison may therefore be made with the effect on animals of poisonous drugs when death is taken as the indicating effect; in this case it is well known that a dose of (say) 100 mg. of drug which kills one rat of 200 grm. will seldom kill all rats of that weight, and the larger the number of rats used the more closely does the percentage of animals killed by a given dose of poison approach a particular limiting value. The higher the dose of poison, within reasonable limits, the larger the percentage of animals dying. The relationship between log. dose of poison and percentage mortality is nearly always of the form shown in Fig. 1. If we now substitute for log. dose, log. (purity in heart index) and for percentage of animals dying, percentage of he-goats converted into young men, it becomes clear that the likelihood of a successful experiment depends on two factors: (1) the index of purity in heart, (2) the number of he-goats used. To take the second point first, if a virgin of purity in heart index (P.H.I.) of 100 could, under suitable conditions, effect a 50 per cent. conversion of he-goats, then at least 20 he-goats are necessary to determine this percentage with an accuracy of 10 per cent. Even supposing the he-

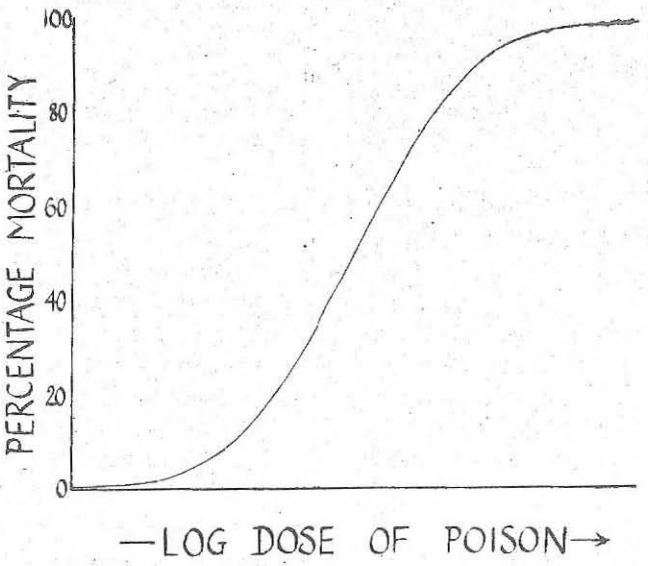

FIG. 1.—Relationship between log. dose of a poisonous substance and the percentage mortality induced by it. The width of the logarithmic dose interval corresponding to a particular increase in mortality varies with different poisons.

goats equally susceptible, we still stand a considerable chance of getting an answer slightly different from 50 per cent. owing to "random sampling." If 20 he-goats are used the chance of converting r he-goats out of 20 into young men in any particular experiment is $\frac{20!}{r!\,20-r!} \cdot \frac{1}{2}^{20}$. A few representative values are given in Table I. If

TABLE I.

No. converted (r)	6	7	8	9	10	11	12	13	14
Chance	0·042	0·084	0·12	0·16	0·176	0·16	0·12	0·084	0·042

Chance of converting r out of 20 he-goats into young men in a single experiment if the mean value of r from a large number of experiments is 10.

the percentage conversion is very small (e.g. 1 per cent.) at least 1,000 he-goats are necessary to obtain an answer accurate to 10 per cent., and since the chance of converting r goats out of 1,000 when the mean answer is 10 is $\frac{1000!}{r!\,1000-r!} \cdot \left(\frac{99}{100}\right)^{1000-r} \cdot \left(\frac{1}{100}\right)^{r}$ the chance of getting discrepant values at this level is considerable. (*See* Table II.)

TABLE II.

No. converted (r)	5	6	7	8	9	10	11	12	13	14
Chance	0·038	0·063	0·091	0·114	0·127	0·127	0·115	0·096	0·071	0·051

Chance of converting r he-goats out of 1,000 into young men in a single experiment if the mean value of r from a large number of experiments is 10.

If now we set about examining a large number of virgins by these methods, it is clear that if only one he-goat is used, the answer is not likely to be trustworthy. If at a particular P.H.I. 50 per cent. of he-goats are converted, we have half a chance of failure using one he-goat only. If only 1 per cent. of he-goats are converted, 99 per cent. of failures might be expected. In my opinion, for preliminary experiments at least 10 he-goats should be used.

Owing to the grave lack of details in the reports on the experiment, it is not known exactly how it was carried out, and particularly whether it was necessary to try the spells on one goat at a time; a great deal of time could be saved if 10 goats could be used at once. If the experiment were repeated with the same 10 he-goats and about 50 different unselected virgins and no he-goat was converted into a young man, the chance of a success at the highest degree of purity in heart available would be less than 10 per cent. and continuation of the experiment would be of doubtful value. In large research institutions groups of 100 he-goats might be used, but it is doubtful whether such large numbers could be ordinarily easily controlled.

If, on the other hand, any particular virgin was capable of converting 5 out of 10 he-goats into young men, most extensive investigations of purity in heart indices would be possible. For theoretical reasons (confirmed generally in practice) it is best to plot log. quantity (in this case purity in heart index) against percentage of animals showing all-or-nothing effect (in this case conversion into young men). Since we have no alternative method of measuring purity in heart we can arbitrarily decide that a P.H.I. of 100 shall be given to a virgin converting 50 per cent. of he-goats, and one of 50 to one converting 16 per cent. It then follows from the nature of the curve that a conversion percentage of 84 corresponds to a P.H.I. of 200, one of 97·5 per cent. to 400, and one of 2·5 per cent. to 25. From this calibration curve the index of any virgin with a P.H.I. not greater than 400 or less than 25 could readily be assessed with fair accuracy, very large or very small values of the P.H.I. being confirmed on larger numbers of animals (e.g. 100). Larger or smaller values than these require prohibitively large numbers of he-goats.

A sample of the information which might be sought is given below:—

(1) What is the distribution of purity in heart in the female population? Is the frequency curve normal or skew? (I have not seriously considered the likelihood of male virgins converting nanny-goats into young women, though it is worthy of attention.)

(2) Is the P.H.I. uniform in the same person from birth to death? If it shows variations, are they regular, cyclic or irregular?

(3) Is virginity absolute or not? Is a woman's *determinable* purity in heart the same immediately after marriage as before, or is it immediately reduced to 0? What about widows?

(4) Does the distribution of purity in heart vary in different places and countries? Can we identify an area by its mean he-goat conversion rate (M.H.G.C.R.)?

(5) Is purity in heart inherited in the familiar genetic manner? If so, are high values dominant to low ones?

(6) The original experiments were carried out on the Brocken. Is it necessary to continue this, or could they be repeated at any height and subsequently corrected from a calibration curve for mean sea-level?

(7) Do negative values of purity in heart occur? Are there women of such impurity in heart that they could, if the spells were repeated backwards at high noon at the bottom of a coal mine, convert young men into he-goats? If so, though experiments on normal young men would have to be prohibited as liable to obvious abuses, persons with such characteristics would be of great value for purely scientific purposes (*see* below).

Certain difficulties arise when large numbers of animals are used, since the usual arrangement in cages in the horizontal or vertical plane is hardly adequate for necromancy, for the audibility of the spells and the intensity of the aura of the virgin pure in heart are necessarily not uniform over the whole area. Though corrections for distance might easily be calculated, it would probably be better to have the animals arranged radially round the experimenters, who would operate on a flat turntable which could be rotated with a small but uniform angular velocity throughout the experiment, which must perforce be carried out at or near sea-level. Gramophonic recordings, if found effective, would much reduce expenditure and time. Difficulties with the sheers could no doubt be solved mechanically. This, however, is a problem for necromancers rather than statisticians.

(8) Is there any qualitative difference in the young men and, if so, does it depend on the he-goat or the virgin used?

(9) What is to be done with the young men produced? Some method of reversing the process would be of great value, especially as the he-goats so recovered would be of proved susceptibility and could be used for breeding a known susceptible stock. Or possibly

H.M. Government would subsidize the production of young men by this process until equality in numbers between the sexes was reached. All thoughtful persons must of course regard the indiscriminate conversion of he-goats into young men with grave concern, for their is no knowledge of what education or social, political, or economic views such young men might have, and it might well be that their behaviour would bring scientific experiment into disrepute. It is therefore suggested that these experiments should be entirely limited to laboratories licensed by the Home Office for the purpose, and that they should be carried out, and if necessary subsidized, by the Medical Research Council, which might also breed the standard he-goats required.

REFERENCES.

Illustrated London News (1932, June 25, clxxx, 1057, 3 photographs).

C. L. OAKLEY.

PLAINTIVE PLEA.

We do not claim we have a cure
For every patient that we treat;
In fact some think it only meet
To send such cases as they're sure
Are past all human aid.
Then when improvement fails to show
The students hear, "I told you so.
What can be hoped for from hot air?"
Ah! Mr. W-l-ms is that fair?
But this you've often said.

We treat all kinds of different cases,
Carbuncles, boils and palsied faces,
Aching backs and arms which tingle,
Arthritis multiple and single.
We straighten too the scoliotic,
Unbend the curve in the lordotic,
While twice each day we go to Tip's
Vitallium arthroplastied hips:
We blush! for we believe our best
Results are with th'asthmatic chest.

So seeing that they're such a lot
Of things we benefit, do not
Please think in us you've found
Merely an ideal dumping ground
For deaf and daft and moribund.

From the PHYSIOTHERAPY DEPT