clerks and dressers from hospitals which have been seriously damaged to those which have not. Classes for both pre-clinical and clinical students continue to be held at the university and its teaching hospitals. At Manchester the usual curriculum is being followed; fees, scholarships, and resident appointments are the same. Owing to the depleted wards in the Royal Infirmary arrangements have been made for teaching to be given at the E.M.S. Hospital at Baguley, a short distance from Manchester, and teaching is also being given at other voluntary and E.M.S. hospitals.

The medical course at Leeds has not so far been affected by enemy action. Here, as at other schools, several members of the staff are absent on war service, but their loss has been largely offset by the valuable help received from the emeriti. The number of students has not greatly fallen; women students now form one-quarter of the total. The past session saw the introduction of a revised curriculum, which allows students who have gained the Higher School Certificate in chemistry and either physics or botany to omit the pre-registration course in those subjects and begin at once the medical course proper, which has been extended by three months to five years and nine months.

Sheffield, in spite of heavy air raids at one period, has experienced remarkably little interference with the normal routine of the medical school. The university suffered minor damage, which was soon repaired and did not interrupt teaching. Clinical work continues at all the teaching hospitals, although the number of in-patients has been reduced. For about a month after the heavy air raids out-patient material was scanty, but the situation gradually improved. The number of in-patients is now from about one-half to three-quarters the peacetime level, but Sheffield has always prided itself on the provision of the maximum number of beds per student, and claims still to be in advance of most other schools in this respect. Maternity cases have been removed from the centre of the city, but there is ample living accommodation for students near hospitals where this work is done.

In Cardiff the arrangements for the clinical school of the Welsh National School of Medicine have had to be somewhat altered because of raid damage to the Royal Infirmary. The infirmary now takes 150 in-patients as compared with its normal 400; other patients are received at the Whitchurch Emergency Hospital four miles away, and here are the beds of the medical and of the surgical units, for which good pathological and radiological services are arranged. A number of other beds are provided at the convalescent home of the infirmary, also four miles out. Thus the normal bed service is practically continued, and school time-tables have been altered to meet the new distribution. The school has a full complement of students (about 350). Out-patient work is done in the morning at the infirmary, and the new Pathology Institute in the infirmary grounds is partly completed and available for use for pathology teaching.

With the reservation of medical students from military service it became a particular obligation upon those responsible to see that medical education was maintained at the highest possible level. How well they have risen to the occasion, even in areas where difficulties were extreme, is evident from the foregoing account.

Special vocational training courses are shortly to be available for all disabled persons whatever the cause of their disability, although for the present they will be confined to those who appear likely, when trained, to obtain and keep employment under ordinary industrial conditions. The courses and the centres where they will be given are being arranged by the Ministry of Labour, but the Ministry of Health in a circular (No. 2449) asks hospitals in the Emergency Hospital Service to notify the nearest Employment Exchange of any patient suffering from some disability which will prevent him from following his original employment. In the case of a hospital which is an Orthopaedic Centre or Fracture Department a special form (W.D.1) should be completed and sent to the Employment Exchange which has been scheduled to serve that hospital (a list is attached to the circular); the Employment Exchange will then arrange for one of its officers to interview the patient. Form W.D.1 is in two parts: the first to be completed by the hospital and the second, a confidential document, by the medical officer.

TESTING NIGHT VISION

BY

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In the *Journal* of April 26, 1941 (p. 636), I gave an account of a method of testing night vision, and of its assessment by definite measurement, that might be of value in judging the night vision of individuals generally. This summer the black-out has not troubled many of us. Soon we shall all once more be affected by it, so that any means of measuring the safety of individuals in such feeble light as there will be out of doors at night is worth considering.

During the summer months I have been able to test large numbers of normal healthy folk, from childhood to the seventies, with the Disk-spotting Night-vision Test (made by Theodore Hamblin, Ltd., 15, Wigmore Street, London, W.1). A total of 700 subjects have been examined and their reactions recorded.

The Disk-spotting Test

The nature of the test is easy to understand. It is a simple imitation of what we see when we look into the sky on a clear starlight night. Sir James Jeans, in an address given in March, 1941, said that the light we see from all the stars, just as with the moon, is a reflection from the sun. "The old idea of Jupiter being a boiling mass has been destroyed, for it has been established that the total radiation of the planets was always equal to the radiation received from the sun." In the disk-spotting test the "sun" is a standard candle burning 120 grains in an hour; this is shielded in a box arranged so that a beam of light radiates in one direction only. The "stars" of the test are white disks mounted on black velvet. Each disk measures half an inch in diameter, and is separated from other disks by an eighth of an inch. The disks are grouped in similar patterns, but the number in each group varies. That these groups of white disks look somewhat like stars was evident when a small boy came into a room where a number of them were hanging on a screen and asked: "What are those stars for?" The distinction of these disks in good daylight is notable. Normal-sighted subjects can count them at 25 metres and more. One young man counted them at 50 metres. There are four groups of disks numbering from four to seven, and since the baseboard can be hung from any corner there are sixteen possible variations. In the night-vision test the disks are hung at a distance of 5 metres from the candle-box. Both are on the same level. The room in which these tests are carried out is totally dark, except for the candle beam and the reflected light from the disks. The subject is required to count the number of disks in the group shown in the candle rays. He begins at a distance of 5 metres from the test and moves either backwards or forwards according to his reaction.

The Illumination.—The reflected light that reaches the eyes in this test is very small: at 3 m. it measures 1/688 foot-candle; at 4 m. = 1/871; 5 m. = 1/1075; 6 m. = 1/1302; 7 m. = 1/1550; 8 m. = 1/1816. Since reflection from a white surface is 84% of the incident light, the glow of the disks at 8 m. is less than 1/2,000 f.c. Moonlight is 1/50 f.c. When one comes out of the daylight into the darkened room the candle beam and the lighted white disks are quite invisible. In making the tests on military drivers the contrast between indoors and outdoors was most striking. These tests were made in a Nissen hut some 10 metres long, in a coppice of thin brushwood. Stepping from the brilliant sunshine out of doors into the darkness of the hut was an almost painful experience. One was quite blind. But more disturbing was the whitish glare that filled the central part of one's field of vision. Slowly this glare faded, and then one could see the candle beam. Fifteen minutes was ample time for this recovery. Every subject had fifteen minutes in the dark before being submitted to the test.

Routine in Making the Test.—The subjects were brought into the dark room in groups of a score. The test was explained to them. They were told that the white blobs they would see in the candle glow were made up of sixpences which they were to count.

For testing large numbers there are certain conveniences: (1) a double room—one for collecting subjects, the other for the test; (2) two capable helpers—one, in black clothes and black gloves, to alter the position and number of the disks constantly, and one to register the results on the prepared charts. Each subject was allowed six trials. Since they saw, or heard, each other's test there was keen interest in the results. Some schoolboys who did poorly asked for a second trial. They were given this, but their reactions did not vary.

A colleague put this question to me: Would it be possible to judge the number of disks in a group by estimating the size or area of the white patch? The answer is, Yes and no. To a new subject there is no knowledge of the difference of size in the groups from four to seven. But to one who has been watching hundreds of reactions, as I have, it is possible to judge the numbers when the difference is considerable—e.g., I can distinguish four and seven beyond my proper distance, but six and seven I cannot separate by size. Counting is necessary for a correct reaction.

Age Groups of Subjects Examined

The subjects were divided into three age groups: Group I from 10 to 18; Group II from 19 to 40; and Group III 41 and over.

Group I.—By the courtesy of Dr. J. Ferguson, medical officer of health for Surrey, I was allowed to examine all the children in a first-class country secondary school. The children were well bred and well kept, and they were expected to give a standard reaction to the test for night vision. They numbered 210.

Group II.—By favour of Colonel E. A. McCuster, M.C., R.C.A.M.C., A.D.M.S. of a Canadian Division, I was permitted to examine large numbers of troops. In civil life Colonel McCuster was an ophthalmic surgeon at Regina, Canada, so his help in arranging for this test was of particular value. These men were a fine class for the test. Their ages ranged from 19 to a little over 40. They were all of first-class physique, and with their full Army rations and outdoor life they were expected to give an excellent night-vision reaction: 427 of these men were examined, 177 of them being drivers of tanks, trucks, and lorries. This group was subdivided into those aged from 19 to 30 (Group IIa) and those from 31 to 40 (Group IIb), the men over 40 being included in Group III.

Group III.—Dr. J. R. Bentley, medical officer of health for Godstone Rural District Council, kindly gathered a number of residents for testing. These and the "over forties" of the Canadian troops numbered 51.

Selecting the Subjects

To get something like standard returns of night vision a standard daylight vision is needed; therefore all subjects had their day vision tested. The day test was made by the use of a modification of my rotary E test. On a two-inch card a letter E (of the size that should be seen at 5 metres) is set on each of the four sides with the "fingers" of the E pointing up, down, right, or left. The card is pivoted on a baseboard, so that it can be rotated freely. It is shifted for each subject. The subject toed the line at 5 metres, with both eyes open. If he gave the correct position of the letters he went on to the black-out room. The test is speedy. Children and soldiers stood in groups awaiting their turn; they saw what they had to do, but no one could learn the order of the letters. It is of interest to note that of the 427 Canadians all passed the test except one N.C.O. aged 43 who was engaged in office work.

Night-vision Reactions

Group I, aged 10 to 18.—The curve of the children's reactions (Fig. 1) is the best of the lot. No less than 48.5% did the test at from 5 to 6 metres. The rise of the curve to these reactions is sharp and distinctive: 29.5% had poorer reactions, but the number of bad ones was small. The reactions were recorded separately both for age and for sex: there was no material distinction for either, except that the very high reactions, at 7.5 and 8 metres, were made only by boys—four each. Six girls did the test at 6.5 metres and four at 7 metres, but none got beyond that. These high results were checked several times.

Group IIa, aged 19 to 30.—In this most important group there were 301 subjects. Their curve (Fig. 2) shows a sharp peak at

5 metres. This peak is slightly lower than that of Group I. The main mass (66%) ranged from 4 to 6 metres, and 22% had poorer reactions. The high reactions, from 6.5 to 8 metres, totalled 12.6%. The actual numbers of these high reactions are more distinctive: twenty-three reached to 6.5 metres; thirteen to 7 metres; four to 7.5 metres, and one to 8 metres. These high reactions were not quite so numerous as in Group I.

FIG. 1.—Group I.

FIG. 2.—Group IIa.

Group IIb, aged 31 to 40.—The curve of this group (Fig. 3) also has its peak at 5 metres, but the mass are more inclined to the lower reactions. No less than 36% reached only 3 to 4 metres. On the high-reaction side the numbers are smaller. Reactions at 6.5 to 7 metres totalled only 4%; and no one reached the highest reaction of 8 metres.

Group III, aged 41 and over.—Of these, 70% were in the forties, but despite their nearness in age to the vigorous adults their returns show a distinctly poorer reaction (Fig. 4). An extra

space on the chart had to be made for reactions under 2 metres. The peak in this group is at 4 and 4.5 metres. Their loss of night vision is most distinctly shown when the figures of better reactions than the average of 5 metres are compared. In Group I no less than 47% did better than 5 metres, whereas in Group III only 18% did better than 5 metres. The decline in night vision with age is the natural effect of the increasing density of the crystalline lenses and the contraction of the pupils. Something

FIG. 3.—Group IIb.

FIG. 4.—Group III.

of the same effect is shown by those of all ages who wear distance spectacles; glass cuts off some light. There were two good cases in this group: a local man who reached 7 metres and a Canadian soldier 7.5 metres. The latter was aged 43 and had exceptionally keen sight.

General Reactions

Certain general reactions were noted in the responses to the test. Those who had a poor reaction showed every sign of trying

hard to see. They craned their heads, bent forwards, moved slightly from side to side, and were only too willing to step closer to the test; whereas those with high reactions—6 metres and more—stood upright and gave their answers quickly and smartly, as though the test was quite easy. Of the soldiers the 14 with the highest reactions were re-examined a week after their first test. A few did slightly better on the second test and some slightly worse. It was found that the latter had just come off night duty; so fatigue accounted for their slight decline. Of these 14 half had blue or grey eyes and half brown; one was colour-blind.

Brewer's *Dictionary of Phrase and Fable* records the term: "Cat-eyed—able to see in the dark." This may well describe those who, in the night-vision test, could see at from 6.5 to 7.5 metres and certainly the few who could see at 8 metres. The Canadian N.C.O. who entered up the records sat outside in the light. He said he noticed that the men with the highest figures seemed most blinded by the light when they came out of the dark-room, while those with low figures did not appear to be bothered. This is a confirmation of the keen sense of light in those with a high reaction. The most astonishing finding in these reactions is the wide variations in the ability of normal-eyed healthy persons of all ages to see in the dark: from 1.5 m. to 8 m.

In my earlier paper I wrote: "I find a fair average for normal-sighted persons is 5 metres. Those with 4-metres range should be safe at night. Those with 3-metres range or less had better stay indoors." These later returns confirm that opinion. I added: "Night-flying men should have a range of at least 6 metres." The later test shows that a much higher range may be attained by many young men, so that the standard for night flyers may be 7 metres or more.

Summary

A large number of normal-eyed subjects of all ages have been given a severe night-vision test which requires ability to count small white disks in a minimum candle-light at a maximum distance. The results show that the average person can count these small disks in light of only 1/1075 candle-power at a distance of 5 metres. They also show that there are some folk with exceptionally keen night vision: some young persons can pass the test even up to 8 metres distance in a light of only 1/1816 candle-power. Safety in the dark demands a fair reaction to this test and ability to see the disks at not less than 4 metres. The extended trial of the disk-spotting test shows that it can be of use in testing large numbers of people with comparative ease and with exactness.

Nova et Vetera

NAPOLÉON'S DERMATOSIS

Did Napoleon suffer from scabies? This question has been debated by Napoleonic students at great length but has never been satisfactorily settled. Perhaps the chief reason for the persistence of uncertainty about this interesting point in the great man's medical history is the fact that it was not until several years after his death that, owing to the efforts of Renucci, the parasitic nature of scabies was finally accepted and the itch mite, or the *Acarus scabiei*, was recognized as the one cause of the disease. Two undoubted facts stand out in regard to the skin disease from which Napoleon certainly suffered during his third and fourth decades: one that it was an eruption attended with severe attacks of pruritus, and the other that scabies was rife in the armies of revolutionary France. The legend is that during a critical action at the siege of Toulon Napoleon seized a ramrod from the hand of a dead gunner, used it himself, and from it contracted scabies, which afflicted him for many years until finally cured by the celebrated Corvisart. Among the countless memoirs and biographies of Napoleon there are numerous references to his skin complaint, and it is suggested that his favourite pose with