this has easily been controlled by a tiny strip of gauze. The wound is usually healed within three days, and the scar is so insignificant that it can only be discerned by close scrutiny.

The instruments I am in the habit of using are a knife, with which the skin is cut transversely for about two-thirds of an inch, and not deep enough to wound the subcutaneous veins; a curved needle on a handle, which is carefully pressed through the middle of the cricoid membrane; two straight sharp-pointed directors, which are introduced on either side of the needle, and which are separated by an ordinary narrow bone elevator or by a tracheotomy dilator; the opening is enlarged with the dilator, and the flat laryngotomy tube is passed on a guide, the end of which is bluntly pointed. The guide and tube were made for me by Messrs. Beauchamp, whose business has now passed into the hands of Messrs. Bailey, of 38, Oxford Street, where they can be obtained.

A sponge with a strip of narrow tape tied round it is thrust down to the bottom of the pharynx, and the anaesthetic is now administered through the tube. If the tube is not quite long enough the end is apt to be tilted against the back wall of the trachea, and the lumen is thus partially occluded. This is easily remedied by fixing a pair of pressure forceps on the broad flange of the tube, and manipulating it as occasion may require.

The operation does not occupy as much as a minute in most cases. Indeed, Dr. Bond tells me that he can now perform it in a few seconds by substituting for the instruments I have named a knife and a pair of sharp-pointed curved scissors, which he directly presses through the crico-thyroid membrane after he has transfixed the skin horizontally at the level of the upper border of the cricoid cartilage.

During the visit of the French medical men to London two years ago, three of the surgeons were present at a partial excision of the tongue which I performed, and were so impressed with the advantage of the preliminary laryngotomy that Professor Poirier told me he should introduce it into Paris.

AN INQUIRY INTO THE ALLEGED FREQUENCY OF CATARACT IN BOTTLE MAKERS.

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At different times articles have been published, chiefly in Germany, asserting the frequency of cataract among glass workers. It has been sought to connect this with the powerful heats to which their work exposes them, and also the sweating which accompanies it. In publications¹ dealing with occupations and their relation to eyesight, I have in past years referred to this question, and said that I had seen something of men following this occupation, and had operated on some of them for cataract, and that, whilst my experience did not permit of my supporting the assertion as to the frequency of cataract among these men, it might be regarded as too limited to contradict the statements of other observers. If extreme heat and consequent loss of moisture were to be regarded as sufficient causes for the production of cataract, then it should be found especially among iron and steel workers, and that my experience did not show was the case.*

In the early part of 1903 a paper² appeared in the BRITISH MEDICAL JOURNAL asserting a remarkable frequency of cataract among one particular group of men employed in glass works—namely, bottle finishers. Details were given of some cases, and it was stated that out of 75 hard cataracts in one year (1902) 18 were in bottle finishers. This number is rendered all the more noticeable as it was further mentioned that in that particular district, with a population of 1½ millions, the bottle finishers only numbered 200 or 300. If the former (200) be taken as the correct number there would be a percentage of 8.5, if the latter (300) of nearly 6 per cent. of cases actually operated upon, meaning, of course, a much larger number suffering from incipient cataract in various

stages, and whose defective sight must have been, more or less, a hindrance to their work. That a generalization, however, on too small data was made may be considered as shown by the fact that the number in subsequent years decreased in the following manner: In 1903,³ there were 57 senile, and 6 in bottle finishers; in 1904, 74 and 2; and in 1905, 85 and 2, and I understand there has been no case at all this year (1906).

Some time since an opportunity presented itself to me for making an investigation with the object of discovering whether or not my doubt as to the real frequency of cataract among the employes in glass-bottle works was well founded or not. Sheffield is situated, I am given to understand, in the centre almost of what may be regarded as the largest bottle-making district in this country, but this will again be referred to. For the purpose of this inquiry I visited a bottle-making manufactory a few miles from Sheffield. I was here given every facility for witnessing the process of bottle-making and of questioning the men whilst at their work. Besides this, a considerable number of the men were assembled afterwards for their eyes to be examined. In this visit and examination I had the assistance of Dr. C. W. Smith, my house-surgeon, and Dr. Barnes, who was also working in my department at the Royal Infirmary. Information as to the work carried on was supplied to me by one who had himself been employed there for many years.

When in full work something like 300 persons were employed, exclusive of those engaged in packing or working in the yard. There were two work places, one known as the bottle-house, and the other, which was the smaller one, the flint-house.

In the bottle-house the workers were engaged in five processes—gatherer, wetter-off, blower, bottle finisher, and taker-in. This round was called a hole, and there were forty-nine holes. The duties of the workers were as follows:

The gatherer gets the metal from the furnace and takes it to the blower.

The blower blows the bottle which has been brought to him by the gatherer on the end of a long blow-pipe.

The wetter-off (a boy) receives the bottle from the blower, who has blown it into a mould. He wets the end with cold water where it is to be broken off, and then hits it over the blow-pipe with a piece of wood. He then takes it to the finisher.

The bottle finisher puts the rim on the top of the bottle.

The taker-in is a lad, and he takes the finished bottle to the kiln to be baked.

The bottle finisher uses a rod, about 5 ft. long, with which he takes a portion of the metal out of the furnace. He sits by the side of the fire, and his right side is most exposed to the heat. There is a board between each furnace. The gatherer, however, who takes the metal from the furnace to the blower on a blow-pipe is really more exposed to the heat, but not so continuously as the finisher. The latter, however, rarely gets his face blistered, but the gatherer does, as the whole of the face is exposed to the light and heat. The blower has no more than the heat of the mass he is blowing to face. The distance which the gatherer has to go with the metal on the blow-pipe is from 4 to 6 yards. This description applies to the making of all bottles except medical and small ones.

For every furnace there are what are called founders, 4 in the bottle-house and 3 in the flint-house. Their work consists in putting the glass into the furnace to make the metal, and they have to stoke. If, for example, they have fed the furnace with 30 barrels of material, they will be looking at the heat and brightness more or less for twenty minutes or half an hour. After that for the next two or three hours they will have to look occasionally only, to disturb it and see if all is right. At the end of about three hours the furnace will need replenishing. During this operation they are exposed to as much heat and light as the finishers or the gatherers. The replenishing has to be done three times a day.

The number of bottles finished each day varies according to size, but the finisher has to face the fire for every bottle. Some days he will finish from 50 to 120 dozen.

In the flint-house, there were 10 holes and 4 workers to each, a bottle finisher, a gatherer, a blower, and a taker-in. The processes are similar to those in the other house, except that here ordinary fuel is used and in the bottle-house gas was employed. The smaller and superior bottles are made in this house. The

*During this inquiry I have looked up my records of cataract operations, and, considering the very large numbers who are employed in iron and steel works in Sheffield and the neighbourhood, I do not find that the number among these operatives is out of proportion to others.

blow-pipes are much lighter. The heat is not so intense. A finisher here may do as many as 140 dozen a day. He warms the bottle to the degree of heat required in a "gloriole," a smaller opening not occasioning such exposure as does a furnace, and then rolls it, and completes the ring. In this house the gatherer is the workman who is most exposed to the heat.

My informant was aged 33, and had been employed by the firm since he was 14. He began as a taker-in, and worked at this for one year and a half, then he became a wetter-off for about fifteen months; at the end of this time for two or three years he was a gatherer. (Whilst employed gathering, the boys learn blowing.) He was only a blower for one year. He has been a finisher since he was 20. The men generally stay on for years, and do not change. At that time there were over 50 bottle finishers, and the same number of gatherers and glass blowers at his place, but he only remembered one man who went away the year before to be operated upon, he thinks for cataract, and he has not been able to work since. He was 60 years old. My informant said he would have known if cataract had been frequent.

I then proceeded to question the men I found working as to their eyesight. In the first shop there were 30 workers, 10 each working as bottle finishers, gatherers, and blowers. None of them admitted to their eyes being affected. In the second shop there were 24 men with whom I conversed, and here, again, similar statements as to sight being unaffected were given. Eight of these men were bottle finishers, 8 were gatherers, and 8 were blowers. The boys were not questioned in either house.

After this we proceeded to a room away from the works, where a fellow workman had collected a number of employes who were not working in the shift I had witnessed in progress. All these men were examined with the ophthalmoscope, but, of course, the use of a mydriatic was out of the question. Among them were 10 bottle finishers, whose ages and length of time at that particular kind of work were as follows:

One was aged 48, and had been a finisher for 17 years.	
The second was 47, " " for 26 years.	
The third was 42, " " for 20 years.	
The fourth was 47, " " for 20 years.	
The fifth was 35, " " for 10 years.	
The sixth was 62, " " for 42 years.	
The seventh was 42, " " for 22 years.	
The eighth was 36, " " for 12 years.	
The ninth was 38, " " for 20 years.	
The tenth was 59, " " for 38 years.	

One was a gatherer, aged 32, and he had worked as such for 12 years. Of 3 glass blowers, one was aged 27, and he had worked as such for 6 years. Another was aged 24, and he had worked for 8 years. The third was aged 29. There was one founder, aged 38, who had worked as such for 4½ years. One of the bottle finishers was at that time a day manager (No. 1), but he said he had to look into the furnaces far more than when he was a finisher. He had been through all the stages at a glass-house from taker-in upwards, and had been a bottle finisher for 17 years. One bottle finisher and one glass blower worked at the flint-house.

I found no evidence of cataract or impaired vision in any of these men. The manager did not remember any one during his 39 years' experience who had to go away on account of his eyes; a similar absence of any acquaintance with eye affections was expressed by the others examined, with two exceptions. A bottle finisher (No. 3) said his father went blind at 45, but inquiry satisfied me that it was not from cataract; another bottle finisher (No. 5) said his father went blind at 70, not having worked for 17 years previously, cause not known. His brother, aged 67, who was a bottle finisher, was going blind.

The only man acquainted with any one with cataract was No. 5, and it was his father-in-law (No. 10) who was affected. He had brought him for examination. His age was 59 and he had been a bottle finisher for 38 years. His sight had been failing for 4 years. He had not known anybody who was obliged to give up work on account of his eyes. This man afterwards came to Sheffield for a better examination under a mydriatic. In both eyes was incipient cataract with the usual characteristics. In the right V = 20, and in the left 20.

When all these men were assembled together the question was asked of one finisher which class of work was most trying to the eyes. He answered "gathering" and all the others present agreed. A gatherer, too, asserted

that "gatherers" got the left side of the face and left arm reddened by the heat.

At a later date, accompanied by Dr. Barnes, I visited another factory—a flint-house—where all work is done at gas tanks. Here the following were employed:

Founders, 14; bottle finishers, 35; blowers, 35; takers-in, 35; and wetters-off, 35. The following were questioned: 4 founders, 9 bottle finishers, and 18 gatherers and blowers (the blowers did their own gathering).

In reply to my questions I found an absence of any knowledge among these men of any failure of sight in their fellow workmen or acquaintances in similar works.* One bottle finisher, aged 43, had worked thirty-three years at all kinds of bottle work. He said that sight in each eye was good, and stated that he had never heard of cataract among the employes.

I met two of the directors of the company and the manager. One director, who had been in the trade for forty years, gave me valuable information, which will be used later. He was connected with other factories, employing altogether a large number of men. He mentioned that one man, aged 66, had to leave his work (not the place I visited) on account of his eyes; there was no evidence of cataract, and he had only been in the hands of quacks. Another man, aged 55, had gone blind from the results of a blow. He had no knowledge of other cases. The other director told me that after an experience of thirty years in the trade he had never heard of a case of cataract, and he had known many hundreds of men. In his own business open gas tanks were used.

During this inquiry I questioned and examined 100 men.

A bottle finisher recently under my care for an accident has given me further useful information. He is aged 56, and has worked in many places in England, Scotland, and Ireland, and has been acquainted with about 2,000 bottle hands. He only knew of one man having cataract, and this was one who came to me, and was operated on successfully and returned to his work. He is included among those to be referred to later.

It has been mentioned that Sheffield may be looked upon as the centre of the largest district of the bottle-making industry, something like 6,000 men being employed. Most of the towns and villages in which the factories are situated are those from which patients are regularly received at the Sheffield Royal Infirmary, but a smaller portion will, in part, gravitate more north for treatment.

To further the inquiry I addressed letters asking for information to fifteen different factories, in addition to the two which I visited. Each letter was accompanied by a form desiring information under the following heads:

Number of workers, divided in classes as under:

Founders,
Bottle finishers,
Gatherers,
Blowers-off,
Wetters-off,
Takers-in.

Proportionate division between—
"Furnaces" (tanks) and
"Pots."

Have you any knowledge that "bottle finishers," "founders," "blowers," or other operatives are particularly prone to cataract? If so, which are the operatives?

How many instances have you known during the last year, or last five years?

Please mention the ages at about which this has occurred.

Replies were received from nine firms, making eleven with the two works which I visited. A table of the results is given on page 10.

I have received an interesting report from a bottle-makers' sick society. It is not a large society, but has been established for over thirty years. During this time there have been 468 members, and of this number 285 have at various times been receiving sick pay, but only one during the whole period has undergone operation for cataract.

The age of those suffering from cataract in glass workers has been recorded variously by different observers. The ages of the cases to which Dr. Robinson particularly alludes are given as 59, 59, 59, 53, 40, and 55. Three of these, aged 59, 40, and 55, were incipient, and had not

* At this place statements were made that bottle finishers and gatherers were the most exposed to the heat. Faces do not get burnt, but sometimes the cheek does, though not often.

Employés.							Total.	Description of Bottles Made.	Extract from Firms' Replies as to Cataract.
Founders.	Bottle Finishers.	Gatherers.	Blowers.	Wetters-off.	Takers-in.				
1	10	29	2	56	10	31	133	All kinds of green and flint, medical and perfumery	"I have no knowledge of any case of cataract during an experience of over fifty years; and my brother, who is three years older than I, confirms this. We can only remember a very few workmen whose sight seemed to fail when they reached 60. It may surprise you to know that my brother, now 65, can read quite small print with the naked eye, and this after working as a bottle finisher for over forty years before both coal and gas furnaces, and where both 'pots' and 'tanks' have been used."
2	12	24	24	24	24	28	136	All kinds of common green glass bottles, Codd's patent, wine, spirit, and jam jars	"Not a single case came under our personal knowledge."
3	14	32	—	64	—	32	142	Not stated	"We beg to state we have never known of a case during over fifty years' experience."
4	32	82	82	82	82	82	442	Mineral water, beer and similar bottles	"We have no knowledge whatever of a single case of cataract, or anything else which necessitated operation on the eye, ever having occurred on these works, and our experience extends over thirty years."
5	8	19	4	34	5	18	88	Medical glass bottles	"None."
6	27	45	47	47	42	43	251	All kinds	"We have not heard of any cases of cataract among our workmen."
7	7	59	59	59	49	59	292	All sorts	"One case only."
8	22	48	48	48	42	48	236	Not stated	"After thirty years' experience, we have never known a case of cataract among our workmen."
9	18	50	50	50	50	50	238	Aerated water bottles	"No knowledge of any case."
10	14	35	35	35	35	35	189	Medical bottles and others	"No case."
11			Works closed				—	Dispensing bottles	"When works were running, we did not hear of any operatives suffering with their eyes."
Total							2,202		

then been operated upon. I can find records of 4 cases only in my practice upon which I had operated in the last six years. This may not be strictly accurate, as the occupation of patients has not invariably been mentioned in the case-books. The ages of these, however, were 55, 64, 59, and 66. The age does not differ much from that of ordinary cataract patients undergoing operation in this country.

Out of the last 1,042 consecutive cataract extractions in my hospital practice 668 were for men, and of these there were only three glass workers, their ages being 55, 64, 59. Of the 668 men, 47 were between the ages of 30 and 40; 67 between 40 and 50; 159 between 50 and 60; and 237 between 60 and 70, the greater number being about 60 or over.

Quite different as to age are the observations of Meyhofer, Hirschberg, and Pröbsting. Meyhofer⁴ in a little more than two years had 4 cases of cataract in glass makers, aged respectively 28, 27, 29, and 24. His examination showed that the cataracts were soft; two were mature in the left eye, in one the left was more advanced, and in the other the right was normal. His examination of 59 glass workers bore out the frequency of affection of the lens in young workers. Hirschberg⁵ gives a higher age. Five cases "40 and over": 2 had been operated upon and 3 had not advanced so far. Pröbsting,⁶ whilst affirming the occurrence of cataract in glass workers, found the percentage twice as great in men over 40 as in men under that age. On the other hand, Evitzki⁷ in Russia (Moscow) examined 70 workers, and 4 only were affected, the ages being from 43 to 56, a period in which he mentions that cataract is observed even under the most normal conditions. Meyhofer's and Hirschberg's assertion that the left eye is mainly affected is not borne out by the English cases I have cited.

It has been asserted that there is a special liability to cataract in bottle finishers. If it were proved that these men were more often affected than the blowers and gatherers, it must be recollected that the older men are to be found among the bottle finishers. For in the bottle trade there is a progression upwards towards the position which is the better paid, and for this reason the older hands will, as a rule, be found among the bottle finishers and the founders. It should be remembered, also, that the gatherer is more exposed to the heat and glare of the furnace than the finisher.

Hirschberg, in support of his contention that exposure to heat occasions cataract, mentions that he had himself noticed in the East Indies the early appearance of cataract. Most Hindus whom he saw in hospital or operated upon at Calcutta and other places, or met accidentally after they

had been operated upon were only 40, or little more, whilst he gives the average age of the appearance of senile cataract in Germany as 62. It has been already shown that the age of the glass workers in this country coming for operation for cataract is about the same (62). Thinking, however, that his statement as to the age of cataract patients in India needed some investigation, I asked my friend, Dr. Drake Brockman, whose extensive experience of cataract in the East is so well known, kindly to give me any information he could on this point. He sent me the following particulars, which hardly bear out the statement made by Hirschberg, especially if taken in connexion with the early maturity and short lives of the natives.

The number of persons operated on for cataract is shown in the following table:

Age.	Males.	Females.	Total.
21 to 30	99	59	158
31 to 40	309	298	607
41 to 50	872	893	1,765
51 to 60	1,225	762	1,987
61 to 70	503	168	671
	3,008	2,180	5,188

Those included in the first of the above decades of life comprised soft and congenital cataracts; those in the second embraced cortical and diabetic cataracts, occurring in Hindus; those in the third decade were principally cortico-nuclear, with a few Morgagnian cataracts, occurring principally in Hindus; those in the fourth decade comprised, in addition to the last-named forms, the hard nuclear cataract, chiefly in Hindus; those in the fifth decade were hard, senile nuclear cataracts, in some of which degenerative changes in the cortex had taken place. With a very few exceptions all occurred in Mohammedans.

The length of life of natives of India is shorter than that of Europeans. The Mohammedans as a class, as far as I have been able to judge, attain to a greater age than Hindus.

Native women enjoy a shorter life than native men, and become prematurely aged at an earlier date.

Mohammedan men and women live to a greater age than Hindu men and women, as a rule.

In all classes of natives maturity is attained at an earlier period than in Europeans, and but rarely does the period of child-bearing in native females extend beyond the age of 40. Menstruation begins at an earlier age, and the menopause arrives earlier than in the European.

My investigation appears to me to justify, as far as

this country is concerned, the conclusion to which my practice in a large bottle-making district had previously inclined me—that though, as in other trades, there are men engaged in the bottle trade who undoubtedly do suffer from cataract, and who come under treatment for it, there is not sufficient evidence to show that they are liable to the affection to such an extent as has been asserted.

REFERENCES.

¹ Notably in the article in Oliver's *Dangerous Trades*, on *Eye Diseases and Eye Accidents in Relation to Industrial Occupations*, and a paper at the Bristol meeting (1894) of the British Medical Association on the Relation of Some Occupations to Eye Diseases. ² *Bottle Finishers' Cataract*, by William Robinson, M.D., M.S., F.R.C.S., *BRITISH MEDICAL JOURNAL*, January 24th, 1903. ³ Taken from the reports of the Sunderland Eye Infirmary. ⁴ Etiology of cataract: cataract in glass workers, *Klin. Monatsbl. f. Augenheilk.*, February, 1886. ⁵ *Centralbl. f. Augenheilk.*, April, 1898. ⁶ *Centralbl. f. a. Gesundheitspflege*, vol. xviii. ⁷ Abstract in *Ophthalmic Review*, 1890, p. 306.

ACHONDROPLASIA.

WITH NOTES OF CASES.

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ACHONDROPLASIA is a rare form of dwarfism which, though of ancient origin, has not been brought into prominent notice, probably because the majority of cases are either stillborn or survive birth for a very short time. Nothing is known of its etiology, and the only fact which seems clear in its pathology is that there exists a "more or less complete inhibition of the normal row formation of the proliferating cartilage cells in the preparatory stage of ossification." It resembles rickets on the one hand and cretinism on the other, but is readily distinguishable from both, although its close relationship to rickets probably accounts for the occurrence of a certain number of cases in which the characteristic features of the two disorders are more or less blended.

The prominent symptoms of achondroplasia are: A congenital origin; an abnormally large vault to the cranium; depression of the root of the nose; prognathus; arrested development of the long bones of the extremities, with exaggeration of their normal curves; normal development of the trunk; beaded ribs and enlargement of the ends of the long bones from diaphysial and epiphysial changes;

decentralization of the mid-point of the body, which is invariably and persistently above, and not below, the umbilicus; characteristic wheel-spoke appearance of the hands, described as the "*main en trident*"; excess of adipose tissue; protuberant abdomen; lordosis; smooth, pliable skin, with abundance of glossy hair in all the ordinary situations; normal mental condition; a tendency to other congenital malformations, especially to high-arched palate and inguinal hernia.

IN the *BRITISH MEDICAL JOURNAL* of June 30th, 1906, there appeared a paper by Dr. Guthrie Rankin and Dr. Ernest C. Mackay, to which we would refer those interested for a full description of this uncommon and interesting disorder.

The patient who was the text of that paper is a boy, G. G., 9 years of age, 35 in. tall, the youngest of three children, who was delivered after a normal and unassisted labour, but was observed to be misshapen at birth. He has never been seriously ill, and he is more than usually bright and intelligent. His head is abnormally large; the nose is flattened, and there is marked retraction of the bridge; there is pronounced prognathus; the abdomen is fat and prominent, partly from spinal lordosis; the mid-point of the body is immediately below the tip of the ensiform cartilage; the arms are thick and short, and the fingers barely reach the tips of the great trochanters; the humeri and femora are remarkably stumped; the bones of the forearms and of the legs below the knee are curved; the hands are foreshortened, and the fingers are of almost equal length, and deviate from the second interphalangeal joints like the spokes of a wheel. Most of these points are brought out in the annexed illustrations.

The publication of this case has brought to light two

others, equally characteristic, which we are glad to have the opportunity of presenting along with it. Dr. John Cranke sends the account of the first of these cases from Griquatown in Cape Colony. The boy, P. G., is the sixth child of Afrikaner Dutch parents, and was born under normal circumstances six years ago. His brothers and sisters are strong and healthy. He is 34 in. tall, sturdy, and intelligent. He was observed to be short-limbed at birth and he has not grown like an ordinary child. He has a large dome-shaped cranium, marked shortening of the long proximal bones of the limbs, moderate lordosis, decentralization of the mid-point of the body, and well-marked "*main en trident*."

The remaining case is specially interesting because of his age. The true nature of his dwarfism was first discovered by Dr.

Fig. 1.

Fig. 2.

Lunn when the patient presented himself for admission to the St. Marylebone Infirmary. The man, J. G., is 53 years of age, and says he can quite remember