

P-44-326
Nov. 20, 1944 (Received)

Herbert C. Scobie

Age 42
P.M. Hrs. 8

Received from Dr. N. J. Ritterhoff of Hamilton County Tuberculosis Sanatorium of Cincinnati, Ohio, seven sections of lung and one each of heart, spleen, liver and with a green connective tissue mixture plus seven unstained sections. On December 26 he sent a generous gross sample of lung and hilar lymph node tissue for chemical, petrographic and spectrographic analysis. His diagnosis was asbestosis and sarcoid.

OCCUPATIONAL HISTORY - Employed for 25 years in the pipe department of the Phillip Carey Company of Cincinnati, Ohio; for the last 5 or 6 years as foreman. Product, "Air Cell Paper Asbestos Pipes" - using starch, sodium silicate glue and asbestos. Processes, wet except for cutting and squaring ends of finished material. Some dust in spite of exhaust. The hazard in the plant is probably not great as the labor turn-over is low and many employees have worked from 8 to 30 years.

No record that Scobie had been exposed to beryllium or fluorescent substances here or in any other employment.

For Gross Description: see appended protocol. Note that the size and frequency of the large fibrous grey pigmented foci seems more prominent on gross than on microscopic examination. The lesions as in cases of uncomplicated asbestosis, occur toward the centre of lobules which are separated from one another by thick non-pigmented septa. However, there seems to be more fibrous replacement and less emphysema accompanying the grey pigment than in most cases of uncomplicated asbestosis. The minute colorless sarcoid nodules are readily discernible throughout the parenchyma and in places some project above the surface of the thickened pleura. The hilar lymph nodes are larger than in simple asbestosis.

MICROSCOPIC

HEART - Some interstitial fibrosis with a small sarcoid nodule surrounded by connective tissue in a papillary muscle.

LUNGS - The diagnosis of asbestosis and sarcoid is confirmed. The asbestosis seems to be moderate in extent but old while the sarcoid consists largely of young proliferative nodules without conglomeration or hyaline changes. Both inclusion bodies of sarcoid and asbestosis bodies are present.

Indicative of asbestosis are the thick fibrous pleura and interlobular septa and the elongated stringy areas of fibrosis extending along trunks often more or less perpendicular to the pleura. The latter lesions are composed of fairly heavy discrete collagenous fibres and contain considerable amounts of dust and some asbestosis bodies. These masses have contracted to produce more or less stellate borders with radial strands extending into the surrounding alveolar walls. Extending into these masses are terminal bronchioles whose lumina are largely closed. Of course, the associated branches of the pulmonary artery also enter these masses but there has been so much contraction of the scar tissue that the

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characteristic peribronchiolar relationships are no longer recognizable.

The sarcoid lesions are small fibrous or more rarely cellular nodules containing one or more giant cells. As in uncomplicated cases they occur in interstitial tissue, the sheaths of bronchi and blood vessels and the alveolar and interlobular septa. In addition, nodules are found at the margins of areas of the dust fibrosis. Where the dust reaction is heaviest, especially beneath the pleura, the nodules are definitely within the asbestotic fibrous tissue.

The giant and epithelioid cells of the sarcoid show no evidence of degeneration as evidenced by fat stainable with Scharlach R. They are surrounded by a delicate reticulum (black with Foot-Bielschowski) and at the periphery of the nodule are concentric bands of heavy non-hyalin collagen. The elastic tissue is probably pushed aside in the formation of nodules.

Inclusion bodies in the giant cells of the sarcoid granulomas are fairly numerous; those that occur are largely of the round or oval crenated conchoidal type. These stain black with hematoxylin, red with the acid fuchsin of Van Gieson-Weigert instead of black like elastic tissue. Von Kossa's calcium stain is negative. They give a strong Prussian Blue reaction for iron. On testing other cases of sarcoid it found that in them also the inclusions contain iron and not elastic or calcium. Occasionally typical asbestosis bodies are found within the sarcoid nodules.

The asbestosis bodies in the pneumoconiotic tissue reveal marked and unusual modification in ferrocyanide preparations. Many of the bodies have one or several very large swellings either terminal or in the middle of the fibre. Bizarre forms develop about the partially separated bundles of asbestos. The conchoidal rounded masses are much more abundant here than within the sarcoid nodules. Much of the granular dust in the lesions is apparently iron.

The blood vessels and bronchial tree show nothing unusual except the sarcoid nodules in their sheaths.

There is no evidence of inflammatory reaction or pneumonic exudate.

LYMPH NODES - Largely replaced by sarcoid nodules varying from cellular to fibrous in character. No necrosis. All show giant cells vacuolated but no inclusion bodies. Varying numbers of lymphocytes in most of the lesions.

SPLEEN - A few small sarcoid nodules with giant cells but no inclusion bodies.

LIVER - Same as spleen.

KIDNEYS - 0 sarcoid; small foci of sclerosis with arteriolar sclerosis.

CHEMICAL AND SPECTROGRAPHIC ANALYSIS

Ash 6.70% of Dry Tissue
(Dry Tissue approximately 1.1% of Moist Tissue)

		ASH		Elements	
		From Chemical		Spectrographic	
Cu)		Na 4		75	
Ag)		K 36.7		100	
Hg)		Sr N.F.		1.5	
Pb).....Less than 0.15%		Ba N.F.		6	
Bi)		Ca 2.1		80	
Cd)		Al 0.2		50	
Mo)		Mg 0.7		75	
SiO ₂	2.76	P 8.0		60	
Fe ₂ O ₃	8.03	Si 1.3		100	
Al ₂ O ₃	0.37	Fe 5.6		75	
BeO	none found	Mn 0.02		3	
ZnO	0.39	Ti N.F.		5	
MnO	0.03	Cu 25		2	
CaO	2.92	Ag 2		3	
MgO	1.18	Sn 3		3	
BaO	none found	Cr 0.05		1	
SrO	" "	B 0		25	
TiO ₂	" "	Be N.F.		5	
V ₂ O ₅	" "	Pb 10		3	
Cr ₂ O ₃	0.07	Zn 0		4.6	
NiO)		Si 10		0	
CoO)	Less than 0.05	Pt 3			
Na ₂ O	5.44	Cl 0			
K ₂ O	44.40				
P ₂ O ₅	18.42				
Cl	4.61				
SO ₃					
CO ₂	present				

86.82.